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СБОРНИК МАТЕРИАЛОВ

III Всероссийской молодёжной
научно-практической
конференции
с международным участием
"LinguaNet"

LinguaNet



26-27 ноября 2021 г.
г. Севастополь

ФГАОУ ВО «Севастопольский государственный университет»
Институт общественных наук и международных отношений
Кафедра «Иностранные языки»
Кафедра «Теория и практика перевода»
ФГАОУ ВО «Крымский федеральный университет имени В.И. Вернадского»
Институт филологии

LinguaNet

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СОДЕРЖАНИЕ

ИНФОРМАЦИОННЫЕ ТЕХНОЛОГИИ И ФИЗИКО-МАТЕМАТИЧЕСКИЕ НАУКИ

Воронец В. О., Газимагоматов А. У.	
Modern communication in cyberspace: a case study of multilingualism promotion by the United Nations	11
Дорошенко И. А.	
Creating a virtual assistant using Python	15
Лана И. А.	
Malware as a threat to information security	18
Ларькова Е. А.	
Internet addiction is the disease of the XXI century	22
Лебедева Я. В.	
Internet reorganization as a method for its improvement	26
Лукьянченко Н. К.	
Intelligent measuring and information system in the black sea using LoRaWAN	30
Новикова А. В.	
The comparative analysis of on-board car computers' operating systems	32
Пелленен Е. А.	
Google forms and other Google cloud services	36
Петренко В. И.	
The need for innovative development and technological modernization of the city of Sevastopol	40
Пирогов Э. Р.	
Indoor navigation based on marker technology	45
Синий А. А.	
Use of real-time ray tracing technology	48
Сухарев Н. В.	
Using online translator as an effective tool when working with data in foreign languages	52
Устюжанина К. Р.	
Cyber security and strategies to organize it	55
Шадт М. А., Гордеева А. А.	
The problem of jet impingement of a finite thickness on an endless wall	59
Яковлев Д. Р.	
Drones in the marine industry	64

ТЕХНИЧЕСКИЕ НАУКИ

Абдураманов Б. А., Кучма Д. Г.	
Analysis of operation of a single-channel digital USB-oscilloscope with a P323 switch	68
Александров Ф. А.	
The main characteristics of Markov process	74
Андрейчук А. В., Кочетков М. А., Ковязин Б. С.	
Modeling octocopter in SIMULINK environment	77

Ахметшина Ф. Ф., Осадчая Л. И., Дьяченко Ю. О.	
The impact of meteorological factors on pollutant dispersion in the city area	81
Бородина А. М.	
The study of ball lightning theories	85
Браславская Е. А., Коляденкова В. М.	
Nuclear safety at modern nuclear power plants: major nuclear disasters lessons	89
Вайнер В., Волкова Ю. М.	
The outline of the effect of zinc ions on <i>Trichoplax</i> sp. H2	92
Васильченко С. О.	
Regulation of surface roughness and shape deviations	95
Виноградов А. А.	
Theoretical and applied aspects of the implementation of an automated library system in the information and educational environment of a technical university	98
Виноградов В. Е.	
Stabilization of zero gravity position	103
Дюдяев И. А., Майорова В. В.	
Floating nuclear power plants – the future of small-scale nuclear power generation industry	107
Дюдяев И. А., Майорова В. В.	
Analysis of nuclear fuel operating features at WWER reactor	110
Зайцев А. Г.	
Detailing services market prospects and opportunities in the city of Sevastopol	113
Компанийцев Н. С.	
The overview of diesel engines: its evolution and the coming challenges	116
Корчаковский М. А.	
Welding technology in shipbuilding: types and methods	120
Менюк Д. С.	
Evaluation of the operation efficiency of the passive heat removal system at a nuclear power plant with WWER-1000	124
Московкина И. М., Ситников Н. А.	
Study of the controlled generator voltage for voice system design electric communication 220V, 50HZ	128
Мочалина Н. А.	
Development of Pioneer-M vessel	133
Мурашковский И. А.	
The features of the production of hot drinks cups	136
Панков В. В.	
Virtual reality technologies in sailor`s work	139
Пименов А. И.	
Basic principles of polymer composite materials manufacturing	142
Подставкаина А. М.	
Logistics consulting as a future step for the development of consulting and logistics	145
Понякин Д. И.	
Prospects for the development of tanker construction	151
Просвиринов О. И.	
Electric vehicles and ecology	155
Резепкина Е. В.	
Dynamic loads in the transmission that occur when the clutch is engaged	159
Неменко А. В., Никитин М. М., Сатвалдыев О. А.	
The strength evaluation of propeller blades	164
Терехова В. В.	
Development of the financial monitoring system in the Russian Federation	171

Умеров Т. Н., Светиков С. Е.	
Electric joint modules control of a multi-link robotic system	173
Филоненко Т. М., Красников А. С.	
Automation in medicine	179
Швед Д. А.	
Pros and cons of underfloor heating system in the modern interior design	183
Швец А. Э.	
Attitude estimation of autonomous underwater vehicles based on a network of pressure sensors	188
Шенин Д. С.	
The influence of motor vehicles on atmospheric air of the city	192
Юдина Т. В.	
Analysis of metrological activity of the territorial center of metrology in Sevastopol	195

ПЕДАГОГИКА И ЛИНГВОДИДАКТИКА

Алтунина А. А.	
Psychological support of persons with moderate mental retardation and severe multiple developmental disabilities in training and production workshops	200
Бабищ М. С., Маслов Н. А., Кузнецов С. С.	
Learning English with the help of music	203
Баранова А. В., Малицкая Л. И.	
The study of history at school as a promising direction of education of schoolchildren-future members of Russian society	205
Бечикова А. С.	
Persuasiveness of argumentation markers in English research articles of natural science	211
Гарас Е. Р.	
The role of the virtual museum in the school educational process	214
Дуброва Е. И.	
Developing environmental culture among modern students	218
Зверева Е. В.	
Learning a foreign language abroad: advantages and disadvantages	221
Кабанкова Е. Н., Князева Т. В.	
Russian sign language as a modern pedagogical technology in working with special needs children	225
Киричишина А. И.	
Organization of the creative association "Magic Skein": main aspects	228
Кудрик С. А.	
Influence of music on learning English	231
Лавренова Н. П.	
Social interaction skills in children with moderate mental retardation, severe multiple developmental disabilities in the content of education	234
Лысенко В. В., Лысенко А. Р.	
To the question on the Russian pupil's awareness of the U.S. education system	237
Маслиева Е. С., Маслиева С. Е.	
The influence of didactic electronic resources on the formation of younger schoolchildren positive attitude to learning	241
Огурцова Д. А.	
Analysis of the methodology of pedagogical work in the school-commune named after F. M. Dostoevsky based on the work of G. Belykh and L. Panteleeva "The Republic of Shkid"	244

Орехова Ю. М., Цыбякова Е. С.	
<i>On the cadets' critical thinking development at foreign language classes</i>	247
Правдюк О. В., Миронова О., Краузе Н.	
<i>Prospects and results of online cooperation in the field of additional education with native speakers of Greek and English as exemplified by the experience of the training and consulting platform MoGU</i>	250
Рудницкая-Волкова В. А., Наумова А. И.	
<i>The role of English in the development of preschool children</i>	254
Сыркина А. Н.	
<i>Technology of using games based on internet technologies for formation foreign language communicative competence of younger pupils</i>	257
Тимофеева П. К.	
<i>Linguapragmatic analysis of women's autobiographies</i>	262
Ткаченко П. К.	
<i>Depression in the young adult literature</i>	264
Фирсова М. А.	
<i>Interactive technologies as a way of teaching speaking in English classes in secondary school</i>	266
Фролов С. А.	
<i>Features of distance learning foreign language students of the legal profile in the conditions of the pandemic</i>	270
Чупринская Д. А.	
<i>Foreign language teaching methodology and its relation to linguistics and pedagogy</i>	276
Широкова Е. В.	
<i>The problem of translating the Voynich Manuscript</i>	281

ГУМАНИТАРНЫЕ НАУКИ

Алексеев В. Н.	
<i>Specific features of translation of scientific texts (by the example of the article "Black holes are finally trending" and its translation into Russian)</i>	286
Ариштович В. В.	
<i>Newspaper journalism in the context of the modern media systems transformation</i>	289
Борисов С. Д.	
<i>Methods of collecting information online for the history research about formation of the higher education system in Sevastopol after the Great Patriotic War</i>	295
Боронина А. С.	
<i>The status of the Russian language and its functioning in the field of education in Sevastopol during the Ukrainian period (1990–2010-ies)</i>	298
Бочкарев М. А.	
<i>The analysis of the use of anaphora in political discourse</i>	302
Буданова С. О.	
<i>Greek influence on the change of the term word in grammatical texts of the pre-Lomonosov's period</i>	307
Ванюшина К. О.	
<i>The concept of "woman" in the French dictionary of the zone</i>	310
Власюк С. И.	
<i>Feminities in Russian and English as a way to change society: language as an indicator of social change</i>	313

Гонтаренко М. Н.	
Euphemisms in political discourse	317
Гукалова Н. В.	
On the problem of language and dialect differentiation	321
Гусева М. А.	
Basic structural patterns in phraseology of business English terms	323
Есинчук Д. В.	
The role of sentence construction in speech as a way to assess a person's motivation	327
Заруба В. В.	
Modern media as an instrument of soft power in Russia	330
Захарова И. И.	
Difficulties in translating A.G. Baumgarten's "Metaphysics" from Latin into Russia	333
Карнаух Т. В.	
The problem of gender images representation in cognitive linguistics	336
Кондрашкина Е. О.	
The influence of "Silver Age" culture on modern society	339
Костемерова Е. Ю.	
The differences between motivation and need	342
Литвинова В. А.	
A brief history of French loanwords in English	345
Лугаськова И. П.	
The role of the artistic worldview of the epoch in the formation of the author's individual worldview	348
Мазуркина Е. С.	
Language resources as gender markers in internet-based autobiographical memory reports	353
Маркова М. Г.	
Concept and role of legal translation	356
Медведева Е. Р.	
The main values of modern Spanish culture	359
Мялицына А. В.	
Acute social problems raised in "Hard Times" by Charles Dickens	362
Притуляк Я. Л.	
Linguistic difference between British and American variants of "Harry Potter and the Philosopher's Stone"	364
Пурицванидзе М. А.	
Chronotope in the poem by Daniil Andreev "The Iron Mystery"	368
Разливинская Н. А.	
Commemorative practices in urban space: a linguodiscursive perspective	371
Семенюта Н. М.	
Proper names in gastronomy	374
Сергеева М. Д.	
Theories about the origin of the language diversity	377
Скрыльников А. В.	
Traditional media vs. bloggers	379
Сюсина О. В.	
The attitude to death and life in Haruki Murakami's novel "Norwegian Wood": the definition of the concept of perfect imperfection in Japanese philosophy	383
Тараненко В. О.	
Difficulties in translating legal terminology	386
Терехова Е. А.	
The problem of translating the names of Sevastopol's cultural heritage objects	390

Терещенко Ю. А.	
"The magic land" of A.S. Pushkin: Crimea in the poet's literary destiny	392
Холодилова Т. А.	
Features of speech development in bilingual children	397
Чиченкова К. А.	
Gender neutrality in the English language	400
Яремчук Е. А.	
Greek impact on the Iberian Peninsula and the Spanish language	404

ОБЩЕСТВЕННЫЕ НАУКИ

Абдеева А. Р.	
Systematization of compensation payments	407
Авамилева С. С., Ткаченко И. П.	
The bank lending importance for the development of the real sector of the economy	411
Агеева А. А.	
The specifics of "data diplomacy" on the example of the People's Republic of China	415
Алиева О. Н.	
Modern university campuses and using environmental innovations	418
Алиева О. Н.	
Reconstruction of the foundry on the territory of the Sevastopol Marine Plant	421
Ауезова С. О., Касымжанова Н. М.	
Saving the Aral Sea: reality or myth?	426
Батуева А. С.	
The concept of the design space of the historical location of Sevastopol State University in Gogol Street	430
Белоусова А. И.	
Scientific interest evolution in the fortress of Cembalo study (Balaklava)	435
Белоусова А. И.	
19th –20th century research of the Cembalo fortress	439
Вальнев И. В.	
Main illusions in the field of ecology	442
Веревкина А. А.	
Promenade as a concept for the public space formation in coastal cities	447
Градинарова Л. Э.	
Cultural and educational institutions of France as a tool of "soft power" in the Greater Mediterranean	451
Дворников И. П.	
Resource factor of international tension in the Greater Mediterranean region	454
Десятерик Д. И.	
The role of tobacco in the history of Medieval Europe	457
Джпанян С. А.	
Main stages and trends in the development of international trade	461
Димитриенко А. С.	
French foreign policy in the Greater Mediterranean region in the late XX – early XXI centuries	464
Драпеза В. А.	
Methodology for supporting small and medium-sized businesses in the Republic of Belarus	467
Ерлат Д. Ж., Абдигалиева Я. С.	
The current demographic situation in Kazakhstan	470

Зайцев А. А.	
<i>The Modern East: main models and development prospects</i>	476
Захарин О. С.	
<i>Formation of the innovation system of the city of Sevastopol</i>	479
Захаров В. В., Урсов А. И.	
<i>Global prerequisites and trends in the development of merchant shipping in the modern world</i>	484
Иванцова Е. Д.	
<i>Challenges and benefits of surrogate motherhood</i>	487
Илива М. Н.	
<i>International business in the time of Covid-19: constraints and opportunities</i>	490
Ильичев А. В., Ситало М. С.	
<i>The history of Scottish male costume</i>	494
Исаева А. М.	
<i>Image of Russia in the media of the countries of the Greater Mediterranean</i>	497
Камаева В. В.	
<i>Public diplomacy in the countries of the Greater Mediterranean: the case study of Spain</i>	500
Колонова Е. М., Иванцова Ю. А.	
<i>Main definitions of physical education and sport</i>	502
Костина Д. К.	
<i>Migration processes in the Greater Mediterranean region</i>	504
Кошлань А. А.	
<i>The problems of necessary self-defense practice in the Russian legal system</i>	508
Кузнецова М. А.	
<i>Investment attractiveness of the hotel industry in the Crimea and the city of Sevastopol</i>	512
Лебедь Н. И.	
<i>Specifics of private military companies' activity in Ukraine</i>	516
Лопатина Т. А., Гармашова Е. П.	
<i>Financing innovation as a factor of economic growth of the country</i>	520
Лукьянова М. Д.	
<i>Impact of the coronavirus pandemic on small and medium-sized businesses in Russia</i>	524
Лысенко В. В., Кузьменко М. А.	
<i>Glass ceiling effect in gender management</i>	529
Мадедина О. С., Гладышев Р. Е.	
<i>The reverse side of information abundance</i>	533
Малкина М. А.	
<i>Balance of interests in Russian-Korean foreign trade</i>	537
Мартынова Е. И.	
<i>Role of the Decembrists in the history of landscape art in Chita</i>	541
Милютин В. В.	
<i>Cargo operations and their significance in the world economy</i>	543
Михайлова А. Д.	
<i>The UK labour market: the trend of growth in demand for highly skilled labour force</i>	548
Никитина Е. В., Шулин П. Р., Ткач В. С.	
<i>Environmental safety on sea vessels</i>	551
Нуриев Р. А.	
<i>Reasons of price growth for residential real estate in Moscow during the COVID-19</i>	554
Пересада Е. Г.	
<i>France as the "founder" of human rights in Europe</i>	556

Приходько О. А.	
International legal basis for the protection of human rights	560
Прошина В. А.	
Trends in the security services market in the Russian Federation	565
Ратанов Н. О.	
Combating cybercrime: analysis of legislations worldwide	570
Сагитова З. З.	
Provision of social services during the pandemic	573
Синицын И. Б., Теплова Т. Е.	
Reasons for George V's refusal to grant political asylum to Nicholas II	576
Сметанина М. А.	
Design code of Nakhimov Avenue as a means of forming the image of the city of Sevastopol	579
Сотула Е. П.	
Environmental legal issues	587
Сутункин К. Э.	
International maritime sector in a global pandemic of COVID-19	591
Ткачук И. С.	
The crisis of the party systems in modern France	594
Турта Д. Э.	
The middle class as the basis of civil society	597
Хорошуннова Д. А.	
Modern approaches to the study of desertification	602
Чередниченко А.В.	
Anglo-Saxon legal system: review of its history and development	604
Чубарь М. В.	
Comparative analysis of South-East Ireland and South Korea labour markets	608
Юрченко В. М.	
Constitutional right to life	613
Яценко И. С.	
Comparative analysis of subsidies for financial support of the state task on the basis of music schools of the city of Sevastopol	618

ИНФОРМАЦИОННЫЕ ТЕХНОЛОГИИ И ФИЗИКО-МАТЕМАТИЧЕСКИЕ НАУКИ

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## **ОСОБЕННОСТИ СОВРЕМЕННОЙ КОММУНИКАЦИИ В КИБЕРПРОСТРАНСТВЕ (НА ПРИМЕРЕ ПРОДВИЖЕНИЯ МНОГОЯЗЫЧИЯ ОРГАНИЗАЦИЕЙ ОБЪЕДИНЕННЫХ НАЦИЙ) MODERN COMMUNICATION IN CYBERSPACE: A CASE STUDY OF MULTILINGUALISM PROMOTION BY THE UNITED NATIONS**

**Аннотация.** Развитие современных цифровых технологий способствовало значительному расширению возможностей профессионального и личного межкультурного общения, а также созданию нового информационного пространства в сети интернет. В статье рассматриваются проблемы современной коммуникации в киберпространстве. Особое внимание в работе уделяется понятию «многоязычие» и механизмам его продвижения со стороны Организации Объединенных Наций. Многоязычие позиционируется основой продуктивного международного многостороннего общения в современном мире. В исследовании проанализированы официальные документы ООН и действующие международные проекты по поддержке культурного и языкового разнообразия. Также в работе представлены международные проекты, направленные на продвижение многоязычия в киберпространстве. В выводе определены основные направления разработки безопасного киберпространства и пути преодоления возникающих проблем коммуникации в сети интернет на международном уровне.

**Abstract.** Digital technologies have reshaped the process of professional and personal intercultural communication and stimulated the development of new information environment. The research focuses on the issues of modern communication in cyberspace. Special attention is given to the analysis of multilingualism as a global phenomenon and its promotion by the United Nations. The study examines various UN official documents and current UN international projects to support cultural and linguistic diversity. The authors also consider international projects and procedures on the promotion of multilingualism in cyberspace. In the conclusion, the main trends in the design of secure cyberspace and major solutions to settle the disputes in online communication are outlined.

**Ключевые слова:** многоязычие, киберпространство, коммуникация, проекты ООН, кибервзаимодействие.



**Key words:** multilingualism, cyberspace, communication, United Nations projects, cyber interaction.

Multilingualism is associated with global multilateral communications [3]. The development of the Internet has led to the establishment of close ties between the nations all over the world and has promoted new ways of communication in cyberspace. Currently, cyberspace with the spread of digital technologies is playing an increasingly important role in human interaction styles. Moreover, due to the global COVID-19 pandemic, many enterprises, companies and institutions have switched to a remote working mode using technologies and WWW opportunities. Cyberspace is a term used in computer technology and is considered as part of “the virtual computer world and electronic medium to facilitate online communication” [5].

According to statistics the number of Internet users is constantly growing. Although English is still the dominant language (30–35% of speakers), other languages are also widely used in online communication. Moreover, there have been attempts to introduce minority languages into cyberspace, but they are still at an experimental level.

According to the United Nations, preserving cultural diversity and supporting varieties of languages stimulate sustainable development of modern society. In the World Declaration on Cultural Diversity, adopted by UNESCO in 2001, cultural and linguistic diversity is regarded as part of the universal heritage [2]. Languages are used to transmit knowledge and share information. Some languages today can open up new opportunities or create obstacles for global social interaction. This fact can lead to even greater social exclusion and inequality between people and communities, and therefore the need for action becomes an urgent necessity, especially in digital era.

Multilingualism is of particular importance to the United Nations because it is a significant factor of harmonious communication between people of different language groups. The main problems associated with the promotion of multilingualism are the necessity for the authorities to develop reliable information and language policy, introduction of regulations and standards as well as the development of infrastructure to support linguistic diversity.

The given study is aimed at the analysis of the strategies and digital solutions of the UN to ensure equal access to information, communication and interaction for multilingual participants in cyberspace.

To promote multilingualism UNESCO supports creativity and innovation in the production of local content materials for radio, television and news media through the Creative Content program. It supports the development of public broadcasting in all languages, which facilitates the encoding of texts using the Unicode standard.

Besides, UNESCO forges partnerships and takes joint actions to promote cooperation and develop recommendations on global language issues. For example, UNESCO and the International Telecommunication Union (ITU) organized a “Global Symposium on the Multilingual Internet” (Geneva, 2006). UNESCO appointed a coordinator of activities in the field of “cultural diversity and identity, linguistic diversity and local content”. Since 2004, the UNESCO Kingston Office has held the annual conference on “Cultural Diversity and the Caribbean Information Society” (CARDICIS), that provides an opportunity to share information and experience in drawing policy proposals in the Caribbean.

Among various UN projects to support local content we should outline:

- the creation of the radio station “Arab-Tamazigh” in Morocco;
- the establishment of community multimedia centers and multilingual radio and television stations, web and video projects, especially in Asia and Latin America;
- digitization of Thai language texts for minorities in northeastern Vietnam;
- the creation of a digital library on human rights in Kazakhstan and a digital library of representative works of Arabic literature.

Also, the UN has focused on the promoting multilingualism in cyberspace. In 2003, UNESCO adopted a Recommendation on “The Promotion and Use of Multilingualism and Universal Access to

Cyberspace”. In this regard, it has launched “The B@bel Initiative”, which uses information and communication technologies (ICTs) to promote linguistic and cultural diversity in cyberspace, as well as to protect and preserve endangered languages. While the B@bel Initiative is coordinated by the Communication and Information Sector, many of its activities are developed in a cross-sectoral manner. These activities include:

- the creation of a library of sound recordings in endangered languages;
- the development of an interactive online add-on for the UNESCO Atlas of the Endangered Languages of the world;
- creating a platform for multilingual content management that supports the use of the Internet;
- preparing pilot projects on free software for the accumulation of digital information on indigenous languages;
- the creation of a module on communities that use endangered languages, including mechanisms to provide systematic support for the preservation of languages [2].

By removing language barriers to information, “The B@bel Initiative” contributes to bridging the digital divide, as well as to the success of UNESCO's efforts to promote knowledge societies and universal access to information, thus implementing the task of “The Education for All”.

It should be noted, that public and private sectors at the local, national, regional and international levels should ensure the provision of the necessary resources and take the necessary measures to reduce language barriers and enhance interactive communication between people via the Internet, so that all cultures have the opportunity to express themselves and access cyberspace in all languages, including indigenous languages. Member States should develop an active national policy on the crucial issue of linguistic survival in cyberspace, aimed at promoting the teaching of languages, including native languages. UNESCO together with other international organizations, should create a joint online observatory to monitor current policies, regulations, and technical recommendations [4].

To achieve the goals some projects have been carried out. Participants of the World Expert Meeting “Multilingualism in Cyberspace for Inclusive Sustainable Development” spoke about many initiatives to increase the integration of language groups, one of which is “The Kamusi project”. The project “Kamusi” (Swahili means “vocabulary”) approaches cyber-inclusiveness from a broader perspective, creating a variety of resources that can be used in different languages. These tools can be used to collect and validate linguistic data, and then leverage these data for the use by experts, learners and machines. Thus, “Kamusi” is based on the idea of differentiating the concepts that are voiced in each language, and establishing the relationship between these expressions in different languages – as much as possible. Delimiting concepts includes obtaining data, determining the meanings of polysemous terms, verbose expressions, and all inflectional forms of a word. Linking involves linking ideas that are more or less comparable across languages, with an emphasis on differences and similarities. Collectively, monolingual datasets for multiple languages, combined in a large multilingual repository, constitute an expression matrix that can then be used across a range of interesting language technologies. However, for most languages, digital data have never been collected in a meaningful way, and even for existing digital linguistic data there is no single method for automatically aligning datasets. Therefore, many of “Kamusi” activities are related to the acquisition or processing of data in direct cooperation with native speakers [1].

One of the most significant tasks in solving the problem of multilingualism in the information society is the improvement in the quality of automatic, human-machine translation of text, which is widely used by people with different languages. Specialist have been working intensively on the project for many years, but the results cannot be called satisfactory. For example, SYSTRAN, a European leader in software and solutions for desktop, enterprise and web-based machine translation systems, has been in the field for over 30 years. The resulting products don't allow to transfer information in 20 pairs of languages in 40 directions of translation in 20 areas of application.

The considered activities facilitate multilingual communication and interaction, especially in online business sector. However, when there is a need for high-quality translation of diplomatic

documents, scientific papers or technical manuals, machine translation technologies are not effective enough and are used only to assist the work of a human translator. Besides, the problem of translating minority languages for their integration into the World Wide Web is mostly not instrumental and technical, but content based and semantic. Scientists believe, that the development of artificial intelligence and modified algorithms for semantic analysis will improve translations practices in future.

Nowadays, language barriers may hinder further development of international economic, scientific and cultural cooperation in digital era. Therefore, organizations must develop modern environment and introduce new means to support multilingualism in cyberspace to maintain linguistic equality.

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**СОЗДАНИЯ ВИРТУАЛЬНОГО АССИСТЕНТА  
НА ЯЗЫКЕ ВЫСОКОГО УРОВНЯ PYTHON  
CREATING A VIRTUAL ASSISTANT USING PYTHON**

**Аннотация.** В данной статье представлен краткий обзор специфики виртуальных ассистентов, в качестве перспективной отрасли IT-технологий. Произведен поверхностный анализ конкурентоспособных программных продуктов, представленных на сегодняшний день. Описаны этапы проектирования и создания продукта IT-направления.

**Abstract.** This article presents a brief overview of the virtual assistants as a promising IT technology industry. A preliminary analysis of competitive software products presented to date has been made. The stages of designing and creating an IT product are described.

**Ключевые слова:** современные информационные технологии, программирования, голосовой ассистент.

**Key words:** modern information technologies, programming, voice assistant.

In the modern information field, one of the topical topics is artificial intelligence. One of the main directions of this industry is the voice assistant.

The voice assistant is a digital structure based on artificial intelligence and recognizes human speech. Person (user) pronounces voice commands that the assistant can recognize and perform a variety of actions, depending on the algorithm embedded in it. Voice assistants are mainly used in smartphones, smart speakers, as well as some modern browsers. Also, the assistant is indispensable for people with disabilities as it makes it easier to interact with devices. The introduction of this system is expedient in a groundless process due to the fact that the value of digital resources has increased in it [2].

The main reasons for the use of vocal assistants are:

1. System efficiency.
2. Access speed.
3. Multitasking.
4. Accuracy of request processing.

To date, the following voice assistants have been rearranged on the market:

1. Google Assistant (in 2016, the corporation introduced a software product that became an example of voice assistant technology. Android Google Assistant has become the most common voice assistant on the planet). This is illustrated in Fig. 1.
2. SIRI from Apple (the first voice assistant with an embedded neural network).
3. Salute, Sber (able to make monetary transactions).
4. Marusya from Mail.ru (the voice assistant that has become the main one on smart speakers).



**Figure 1.** Google Assistant

The first difficulty in developing a voice assistant is the choice of the language in which it is possible to implement the basic algorithms of this software product. The solution to this problem was the high-level Python language.

Python is a general-purpose programming language aimed at improving developer productivity, code readability and quality. As shown in Fig. 2, this language has libraries that implement sound-to-text conversion functions and text-to-sound conversion functions.

```
import speech_recognition as sr
import pyttsx3
from fuzzywuzzy import fuzz
import datetime
import random
import sys
from os import system
from colorama import *
import webbrowser
import pygame
import pyttsx3
import os
import pygame
```

**Figure 2.** List of libraries used in development

After that, an algorithm for separating commands was developed: the program converts the speech stream into text, which in turn is analyzed and divided by the method of keywords. In this case, the keywords are different variations of the name of the voice assistant (Fig. 3).

```
ndel = ['фима', 'фимка', 'эфимия', 'ладно',
        'не могла бы ты', 'пожалуйста', 'текущее', 'сейчас']
```

**Figure 3.** List of name variations

As can be seen from Figs. 4 and 5, further, various functions have been developed that the software product should perform, such as searching for data on the Internet, determining system time, running routines.

```
def time():
    now = datetime.datetime.now()
    talk("Сейчас " + str(now.hour) + ":" + str(now.minute))
```

**Figure 4.** Implementation of the system time detection function

```
def quite():
    x = ['Надеюсь мы скоро увидимся!', 'Рада была помочь', 'Я отключаюсь']
    talk(random.choice(x))
    engine.stop()
    system('cls')
    sys.exit(0)
```

**Figure 5.** Implementation of the program shutdown function

Pygame is a set of modules (libraries) of the Python programming language designed for writing computer games and multimedia applications [1]. Pygame is based on the SDL multimedia library. Pygame was originally written by Pete Shinnars. Since about 2004-2005, it has also been supported by the free software community.

Pytsx3 is a Python text-to-speech library. Unlike alternative libraries, it works offline and is compatible with both Python 2 and Python 3.

Thus, this paper contextualizes the automatic speech recognition. More specifically, you can load a finished pipeline with a pre-trained model and take advantage of eager TensorFlow 2.0 and freely track model weights, activations or gradients [3].

The datetime2 module provides Python date and time classes. In addition to the functions of the standard datetime module, it adds the ability to construct and represent dates and times in many formats, and removes some of the limitations in the original package.

Random package provides a ported version of the Python 2.7 random module to Python 3. It has also been ported to work from Python 2.6. In Python 3, the implementation of randrange (start, stop, step) has changed so that even with the same seed, you end up with different sequences in Python 2 and 3. Note that some high-level functions like randint (A, B) and choice (sequence) use randrange (start, stop, step).

Sys is an ongoing development from Andreas Evensen, a student at Lund University. Package contain numerical-analysis tools that were used through the bachelor program of physics, at mention University. Mainly the Analysis-tools are simple but effective.

Colorama makes ANSI escape character sequences (for producing colored terminal text and cursor positioning) and work under MS Windows.

OpenStack fault-injection library does destructive actions inside an OpenStack cloud. It provides an abstraction layer over different types of cloud deployments. The actions are implemented as drivers (e. g. DevStack driver, Fuel driver, Libvirt driver, IPMI driver, Universal driver).

Pycopy-webbrowser is an implementation of a module for the standard library of Pycopy project. It contains zero or very little functionality, and primarily intended to avoid import errors (using idea that even if an application imports a module, it may be not using it one very code path, so may work at least partially). It is expected that more complete implementation of the module will be provided later.

From the research that has been carried out, it is possible to conclude that virtual assistant software is a competitive product and it has the ability to implement a neural network with deep machine learning into its structure, which in turn gives limitless possibilities of using programs in various branches of modern infrastructure. And also, the introduction of the system in the educational process is advisable in the modern realities of the digital space.

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## ВРЕДОНОСНЫЕ КОМПЬЮТЕРНЫЕ ПРОГРАММЫ КАК УГРОЗА ИНФОРМАЦИОННОЙ БЕЗОПАСНОСТИ MALWARE AS A THREAT TO INFORMATION SECURITY

**Аннотация.** Статья посвящена актуальной на сегодняшний день проблеме компьютерных вредоносных программ как угрозе информационной безопасности. Цель исследования – рассказать почему вредоносные программы являются риском информационной безопасности для рядовых пользователей ПК и крупных корпораций. В статье рассматриваются технические особенности работы некоторых версий вредоносных программ. Приведены сведения о вспышках компьютерных вредоносных программ и их экономическом ущербе. Особое внимание уделено классификации вредоносных программ.

**Abstract.** The article is devoted to the actual to date problem of computer malware which is an information security threat. This study aims to show why malware is the risk of information security for ordinary PC users and large corporations. The article deals with the technical characteristics of some versions of malware work. Also, there is some information about outbreaks of computer malware and its damage to the economy. Special attention is paid to the classification of malware.

**Ключевые слова:** вирус, вредоносная программа, предотвратить заражение, информационная безопасность, антивирус.

**Key words:** virus, malware, prevent infection, information security, antivirus.

Malware, short for malicious software, is a blanket term for viruses, worms, trojans and other harmful computer programs hackers use to wreak destruction and gain access to sensitive information. Shorthand for malicious software, malware typically consists of code developed by cyberattacks, designed to cause extensive damage to data and systems or to gain unauthorized access to a network.

Let's get back in 1980-s. The first ever known virus was written in 1981 for Apple computer and was called Elk Cloner that spreads in the wild. It's not destructive, but anyway it's a virus. The principle of work is very simple. The infected floppy contained a game which was then set to play. If a computer booted from an infected floppy disk, a copy of the virus was placed in the computer's memory [2, p. 14]. The 50th time the game was started, the virus was released, but instead of playing the game, it displays this poem telling us about the virus as it shown on Figure 1:

```
ELK CLONER:
THE PROGRAM WITH A PERSONALITY

IT WILL GET ON ALL YOUR DISKS
IT WILL INFILTRATE YOUR CHIPS
YES IT'S CLONER!

IT WILL STICK TO YOU LIKE GLUE
IT WILL MODIFY RAM TOO
SEND IN THE CLONER!
```

**Figure 1.** Elk Cloner Poem

This method of infection is called boot sector infection.

However, the Apple was occurred in the past, nowadays we are using IBM-PC compatible computers. The first one virus written for IBM-PC was written by two brothers from Pakistan in 1986 and was called Brain. Brothers didn't even think about harming user's computers. Brain was created to protect medical software that was created by them. Brain affects the IBM PC by replacing the boot sector of a floppy disk with a copy of the virus [3, p. 166]. The real boot sector is moved to another sector and marked as bad. Infected disks usually have five kilobytes of bad sectors. The disk label is usually changed to Brain, and the following text can be seen in infected boot sectors as it shown on Figure 2:

```
Welcome to the Dungeon (c) 1986 Amjads (pvt) Ltd VIRUS_SHOE RECORD V9.0
Dedicated to the dynamic memories of millions of viruses who are no longer
with us today - Thanks GOODNESS!!! BEWARE OF THE ex...VIRUS : this program is
catching program follows after these messages....$#@$$@!!
```

**Figure 2.** Message that Brain virus contains itself.

Virus infects only floppy disks, so hard drive won't ever be touched, because of lack of code for dealing with the hard disk partitions by only checking the most significant bit of the BIOS drive number being accessed.



Times go by, with new technologies malware evolves. Throughout the early 2000s, malware became even more prevalent. The use of rootkits, toolkits, crimeware kits, and even SQL injection attacks rose dramatically. Along with new techniques came even larger infection rates. The ILOVEYOU Worm alone affected over 50 million computers and caused over \$5.5 billion dollars in damages [3, p. 170]. The virus, sent through an inconspicuous email, caused parts of the Pentagon and British government to shut down some of their email servers.

The SQL Slammer Worm was developed in 2003. This vicious attack affected over 75,000 computers in less than ten minutes. The effects from this were slower internet usage worldwide. The Cabir Virus in 2004 was the first to attack mobile phones, while the Koobface Virus the following year targeted social media platforms such as Facebook and Twitter. The Conficker Worm also caused widespread damage in 2008. Not only was the spread and rate increasing with each new development in malware, but also new platforms and devices were being targeted.

In 2010, the Stuxnet Worm was speculated to have been created to attack Iran's nuclear program and may have had an entire team of programmers behind its development. Backoff was a virus launched in 2014 with the purpose of stealing credit card information from Point of Sale (POS) systems. WannaCry was one of the worst ransomware programs to come on the scene. It affected users around the world and completely locked people out of their accounts and demanded payment to regain access to data.

Ransomware developed in the 1990s and early 2000s brought increasingly diverse and expensive attacks into the public eye. Some ransomware was delivered through email attachments, social media messages, pop-up buttons, or even floppy disk usage. Regardless of the delivery method, the programs were well-hidden and would not lead the victims to believe there was anything wrong until it was too late. CryptoLocker, developed in 2013, was one of the early ransomware programs. The program aimed to make a profit by locking people out of their accounts until they paid to regain access. In a short amount of time, the program infected hundreds of thousands of computers and earned the developers over \$3 million dollars in ransoms.

As developments in malware progressed from the 1940s and 1950s, new techniques and uses for malicious software were developed. Programs were no longer harmless or accidentally harmful. They were intended for destruction and corruption. Whether to steal files, spy on computer usage, delete or corrupt files, ransom accounts for profit, or something else, malware has come a long way since its beginnings.

As the spread of malware increases, new uses for the programs are being developed as well. No longer carried by floppy disks, viruses have the potential to spread through internet access, email, and far more, posing a threat to individuals, small businesses, corporations, and government entities alike. Unless systems are protected against these attacks, businesses and organizations risk losing data or having their systems crash. The loss in time and money can be devastating.

According to Symantec there are some classes of malware:

Worms – malware that constantly spreading from computer to computer using all by using P2P networks, local networks, emails, self-copying to HDD's/floppies/USB sticks.

Virus – a piece of malware that (when its presented in memory) injects code of itself to infect another programs.

Trojan – the malware that is under mask of some useful program and users often think that it is not a malware. When user activates it, trojan does its malicious payloads.

Spyware – malware that intended to sniff sensitive user of the data such as logins, passwords, bank accounts, etc.

Rootkit – a program or, more often, a collection of software tools that gives a threat to remote access and control over a computer or other system.

Adware – kind of malware that shows you lots of advertising. When your computer is infected by adware you probably would see suspicious browser redirects to some unknown sites. Adware forces to download and install lots of another more malicious programs.

Ransomware – malware that encrypts or some other way prevents users from accessing their personal files on their PC's. Cyberattackers often ask for the payment in order to unlock files, usually

in cryptocurrency, rarely just by money transfer to bank or phone number. Without a decryption key or password, it is almost impossible to regain access to the files and get back computer to normal state.

Cryptojacking – malware intended to steal funds from cryptowallet or mine it on user's CPU cryptocurrency.

The risks posed by malicious code are on the rise, due to fundamental changes in the threats and purposes that malicious code is put to. Instead of just causing a nuisance and being destructive, malicious code attacks are becoming more motivated by financial gain. Attackers are increasingly sophisticated and organized, adopting methods that are similar to traditional software development and business practices.

The extent of the damage caused by malicious software will often depend on whether the malware has infected a home computer or a corporate network. The consequences of the damage may also vary according to the specific type of malware and the type of device that is infected – plus the nature of the data that is stored on or accessed by the device.

Whereas, in some cases the results of a malware infection may be imperceptible to the user, in other cases the damage can have serious consequences.

In conclusion it is necessary to admit that in order prevent malware infection, you should install antivirus software like Kaspersky or Dr. Web and set it to do regular scans, filter your emails by adding some rules in your mail client to prevent receiving phishing letters and strongly check attachments. You should enable your firewall for it to block unwanted connections from internet, keep your OS updated with the latest security patches and hotfixes [2, p. 2]. Watch out for the compromised and malicious websites. It is also recommended to have a good set of backups. And the most important is to think twice, before clicking the links.

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## **ИНТЕРНЕТ-ЗАВИСИМОСТЬ – БОЛЕЗНЬ XXI ВЕКА INTERNET ADDICTION IS THE DISEASE OF THE XXI CENTURY**

**Аннотация.** В представленной статье изучается интернет-зависимость как болезнь 21 века. Цель исследования – выявить основные причины появления данной зависимости, определить симптомы и последствия. Авторы также делают краткий обзор истории развития Интернета. Результаты исследования позволяют рассмотреть и соотнести между собой понятие «интернет-зависимость», пользу и вред новой зависимости для людей. Для достижения цели и задач используется теоретический метод исследования, а именно изучение специальной литературы и анализ информации на веб-сайтах, посвященных данной теме. Авторы приходят к выводу, что Интернет-зависимость появляется, когда люди перестают контролировать свое время в сети, предпочитая виртуальную жизнь реальной.

**Abstract.** This article examines Internet addiction as a disease of the 21st century. The purpose of the study is to identify main reasons for occurrence of this addiction as well as to define its symptoms and consequences. The authors also briefly review the history of the Internet development. The results of the study allow us to consider and correlate the concepts of Internet addiction, the benefits and harms of the new addiction for people. To achieve the set goals and objectives, a theoretical research method is used, namely reading professional literature and searching for information on web-sites devoted to this topic. The authors come to the conclusion that Internet addiction appears due to the fact that people stop controlling their time online, preferring virtual life to the real one.

**Ключевые слова:** интернет, зависимость, проблема, следствие, влияние интернета, психологическое исследование.

**Key words:** Internet, addiction, problem, consequence, Internet impact, psychological research.

The Internet is a system that is used all over the world. It unites computer networks and is designed for processing, transmitting and storing information. In various sources, the Internet is used as a worldwide network, a global network, or simply a Network. The Internet is built on the basis of connections using protocols such as TCP/IP. The basis of the Internet is the World Wide Web (WWW) and many other systems designed for data transmission.

The history of the Internet begins with the development of computers in 1950 and the emergence of global computer networks in different countries, primarily in countries such as the United States, France and the United Kingdom.

January 2, 1969, can be called the first birthday of the Internet. The Office of Advanced Research Projects of the US Department of Defense (ARPA – Advanced Research Projects Agency) has begun its work on a major project. The result of the ARPA project meant connecting all the

computers of defense organizations. At the end of the study, a new network was created, which was called ARPANET (Advanced Research Projects Agency Network). It was based on the principles on which the Internet was later built [4].

The next stage in the development of the Internet is considered to be the creation of the NSF network (National Science Foundation – the US National Science Foundation). The new network, which was called NSFNET (National Science Foundation Network), united all scientific centers in the United States. The NSFNET network quickly took the place of its predecessor ARPANET. The development of this network required its change, and in 1987 the NSFNET backbone (the base part or backbone of the network) was created. There were based 13 centers, connected to each other by high-speed communication lines. These centers were located in different parts of the United States. So the Internet appeared in the USA.

The second birthday of the Internet was considered in 1983. This year, there were revolutionary changes in the software. There appeared TCP/IP protocols which are the basis of the World Wide Web at the present time. The further development of the network after the introduction of TCP/IP protocols has significantly accelerated. In the second half of the 80s, the domain name system (DNS, Domain Name System) was already formed and began to work. Then the concept of the Internet appeared as a self-developing structure.

High-speed territorial communication channels appeared in the world. Computer networks of countries around the world began to unite, and in the 90s the Internet appeared in its current form. Now the Internet unites many networks located around the world. Currently, the Internet continues to develop intensively and one can find a variety of information in it.

In Russia, the Internet appeared more recently. Computer communication and all developments related to it were used in the USSR only within the framework of the military-industrial complex to strengthen the country's defense capability. In 1990, there was developed the first network of the union scale, the name of which was “Relcom”. When the network appeared, it was used only by scientific organizations that were located in Leningrad, Moscow, Kiev and Novosibirsk. The first communication session was made via a modem connecting a Soviet computer with a foreign one.

In 1991, in the Soviet Union, when there were no browsers at all, the first network with the .su domain appeared. With the advent of the Internet, the idea of creating a browser arose. The first browser was called WorldWideWeb, which made the network easy to use.

A large increase in the number of Internet users in Russia began in 1996. Today, in our country, the Internet has also become a tool that we use every day.

The Internet has many advantages as well as disadvantages. One of the disadvantages is Internet addiction.

Internet addiction is a disorder in the psyche that is accompanied by a large number of problems, mainly consisting in the inability of a person to log out of the network at due time as well as in the constant desire to log in.

The term was first used by Golderg in 1994. He did not mean a disease, like alcoholism or drug addiction, but rather a big problem associated with stress and people's inability to control themselves.

The disease called Internet addiction has not yet been fully studied by psychologists, but the causes of addiction lie on its surface. This may be an attempt to compensate for unrealized needs (for example, to make new friends) or the inability of a person to build relationships in real life, also this includes a problem with self-esteem [4].

Internet addiction is most acute in case of adolescents. Today, psychologists and researchers of Internet addiction problems distinguish six main types of the craving for online dives:

1. The need for constant communication on the Internet;
2. Information addiction which includes online surfing. This happens when a person has an irresistible thirst for a large flow of information, which forces him or her to surf the Network endlessly;
3. Internet gaming addiction;
4. Internet gambling addiction;

5. Internet addiction as a cybersexual attraction, that is an obsessive craving for watching porn movies on the Network and engaging in cybersex [1; 2; 5].

There are many more types of Internet addiction, among which there are hacking, an involuntary craving for buying things at online auctions and online stores; endless downloading of video and audio materials, etc.

Internet addiction is a problem of the modern world. Currently, this addiction draws attention of scientists, researchers and the media. Psychologists call this addiction “an obsessive desire to go on the Internet, and inability to get out of there in time.”

The reasons for Internet addiction can be: the availability of information, constant communication of users in social networks (forums, chats), the possibility of creating an “image”. Psychologists also attribute the lack of communication between people in real life to these reasons.

The following stages of the Internet addiction development are distinguished:

- At the first stage of addiction a person gets acquainted with the Internet. He chooses a personal version of virtual reality for himself. Gradually, a new user forms his own style on the network, which he lacked in real life.

- At the second stage, the user estranges oneself from the real life. He is starting to spend more and more time on the Internet. A person stops using the Internet to achieve his important life goals. Thus, these goals are transferred from their real life to the virtual one.

- The third stage is the transition of the addiction to a chronic form. The problem is already clearly visible, the symptoms of the addiction are obvious. After a while, the user loses activity on the network. A person returns to the reality, but this return is not desirable for him. The dependence persists, of course, although not in the form in which it was before [1; 2; 6].

The following symptoms of Internet addiction are distinguished:

- euphoria from being online;
- contact with other people is lost;
- the sense of time is lost;
- there is no participation in life processes;
- constant discussion of internet topics;
- deterioration of general health;
- mental degradation;
- large financial expenses for online purchases [1; 2; 3; 5].

Internet addiction provokes the development of mental, behavioral and personality disorders. A long stay on the web causes an illusory feeling of well-being, as a person prefers the desired virtual reality to real life.

Researchers point out the following consequences of Internet addiction:

- a person spends all his free time at the computer, losing interest in the real world.
- poor appetite and sleep disorder which affect the state of the body;
- emotional instability;
- a person's communication skills are gradually disappearing;
- a person ceases to follow hygiene;
- there is a drop in academic performance at school and at work;
- memory deterioration;
- various syndromes that indicate pathologies of the nervous system (SND, nervous tic, stuttering, nervous convulsions throughout the body) [3; 5; 6].

People of any age and gender can develop Internet addiction. Moreover, it is impossible for them to solve this problem on their own. Despite the scale of the problem, there is no term “Internet addiction” in medicine. But in many countries this type of addiction is already recognized and people are treated.

Computer technologies have a great impact on the psyche, which can lead to a violation of socio-psychological adaptation. Internet addiction leads to a decrease in performance as well as greatly affects human health.

The Internet has both positive and negative sides. The Internet itself cannot harm or favor a person without his or her participation; it all depends on the person.

Studies have shown that excessive Internet addiction leads to the fact that in reality a person becomes less responsive to others, the warmth in real relationships decreases, and people grow apart.

A person's self-respect and emotional state may depend on the amount of time spent online, and the lack of this time or the forced rejection of the computer can provoke aggression and depressive states.

Another problem associated with excessive Internet addiction is the inability of a person to communicate in real life. Experts have confirmed that the majority of Internet addicts are teenagers. Young people stop communicating in real life and prefer to communicate on social networks.

The study of this problem as a new problem of the 21st century gives grounds for the need for further study of Internet addiction.

It is worth better informing people about Internet addiction. People should be aware of the consequences of excessive Internet addiction. However, everything depends on Internet users. They have the right to be responsible for their actions.

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## **РЕОРГАНИЗАЦИЯ ИНТЕРНЕТА КАК СПОСОБ ЕГО УСОВЕРШЕНСТВОВАНИЯ INTERNET REORGANIZATION AS A METHOD FOR ITS IMPROVEMENT**

**Аннотация.** В статье рассматриваются вопросы реорганизации интернета и возвращения его ко времени, когда совершались значительные научные открытия и внедрялись инновации. Большое внимание уделяется проектам, которые занимаются созданием такого интернета, в котором ключевая роль отдавалась бы конфиденциальности персональных данных и защите информации от несанкционированного доступа. Концепция такой организации сети заключается в особом способе хранения и представления информации в сети. Основная цель проектов, занимающихся разработкой сетей свободного интернета, заключается в хранении данных на серверах независимых центров обработки данных, что позволит повысить безопасность хранения данных. Сделаны выводы о ценности приватности данных, сохранности их безопасности и принципиальной важности оценивания интернета, как свободного рынка, а не рекламной платформы.

**Abstract.** The article discusses the issues of reorganizing the Internet and returning it to the time when significant scientific discoveries were made and innovations were introduced. Much attention is paid to projects that are engaged in the creation of such an Internet, in which the key role would be given to the confidentiality of personal data and the protection of information from unauthorized access. The concept of such a network organization is a special way of storing and presenting information on the network. The main goal of projects engaged in the development of free Internet networks is to store data on the servers of independent data centers, which will improve the security of data storage. Conclusions are made about the value of data privacy, the safety of their security and the fundamental importance of evaluating the Internet as a free market, and not an advertising platform.

**Ключевые слова:** реорганизация интернета, сервер, центры обработки данных, конфиденциальность, Solid, SAFE Network, Dfinity.

**Key words:** internet reorganization, server, data centers, privacy, Solid, SAFE Network, Dfinity.

In the modern world, a person has already accustomed to the fact that there is constant digitalization of society. All new developments appear in the world of IT technologies. Recently, however, there has been a growing trend towards revising the traditional foundations of the Internet. Undoubtedly, now a person can hardly imagine life without the World Wide Web, it is difficult to

overestimate the benefits that people derive from using the Internet. However, there are companies whose activities are aimed at a kind of reorganization of the Internet, revising its concept and improving the network. Dfinity, SAFE Network, Solid are organizations that have been growing rapidly lately. Their activities are aimed at restructuring the Internet in the direction of creating free space. The main vector of development of these organizations is to return the Internet to the days of free development, when users could realize themselves as developers.

The Dfinity Foundation is a non-profit research organization based in Zurich, Germany [3]. The Dfinity team consists of the world's best cryptographers, distributed systems experts and programmers. The company's goal is to improve the Internet, taking it to a completely different level by reorganizing and creating a potentially new way of working on the Internet – the Internet computer.

The Internet Computer is a decentralized technology aimed at enhancing the functionality of the Internet, spreading across a network of independent data centers. This approach allows the software to be freely distributed on the Internet, rather than on commercial cloud services controlled by large firms. Dfinity introduces a new standard called the Computer Internet Protocol (ICP). Now, in order to distribute any software on the Internet, a fixed physical address is not required. The software can be distributed between servers in independent data centers. Undoubtedly, this approach can already be called a breakthrough in the field of IT-technologies, however, it is not so much the way of distributing software products on the network that is important, but the consequences of such changes. The use of the Internet computer aims to bring the Internet back to the days when the World Wide Web was considered a platform for creativity and innovation for developers. Now there is a monopolization of the Internet, the network is perceived as a market with an undoubted dominance of advertising. The Internet computer intends to rectify the situation that has arisen.

An Internet computer hosts software in a tamper-proof environment that allows you to create products that are independent of backup systems and firewalls. This approach to distributing data on a network allows companies to move away from self-contained infrastructure such as database servers.

The situation of growing monopolization of services on the network can be solved by supporting stand-alone software that does not have a specific owner. This method allows you to create open versions of web resources – social networks or services that work as an integral part of the Internet itself. In other words, applications will be created that are not owned or controlled by anyone. This allows users to get much more reliable guarantees of the confidentiality of their data. Data centers will be paid for by developers' crypto tokens to execute their code, but the centers will not have access to the data itself. It is this way of organizing data storage that makes it difficult for advertisers to track user actions on the Internet.

Decentralized Internet can lead to such a form of data management on the web, in which the opinion of all developers and users regarding the regulation of working with information on the Internet can be heard and taken into account. However, Dfinity is not alone in reorganizing the Internet.

In addition to Dfinity, there is SAFE NETWORK, which offers the level of security and privacy currently available on the Internet. The SAFE (Safe Access for All) network is a fundamentally new way of accessing applications, the most important value of which is the confidentiality of user data [2]. SAFE software provides access to email, data storage, applications, conferencing and more.

SAFE Network is moving away from traditional data centers as they are susceptible to information theft and tracking of Internet activity by others. The company offers its own way of organizing work and storing data on the Internet. SAFE technology is to unite all the free computing power of the system users, which will create a global free network.

SAFE Network offers unparalleled online privacy protection for users' data on the Internet. Users no longer have to trust their personal data to organizations. Now everyone can exercise control over their own information. For the provided computing resources and unused hard disk space, network users will be paid with the Safecoin network token.



The autonomous SAFE network allows you to completely exclude human intervention in the organization of data storage on the Internet. No more people and companies setting prices, no more configuration changes and node rules. Human intervention in the network ends with the launch of self-adjusting, self-healing software. Such a network provides access to data storage to all users. Once the user provides the network with their encrypted data, no action is required from him to ensure their security. Until the owner of the data decides to access them, they remain completely confidential. The SAFE network, using a special intelligent system, moves information between nodes, constantly reassigning it to different groups. It is this approach that allows you to ensure the safety and privacy of data. The transition to the use of autonomous networks aims to get rid of “private” storage, which sooner or later, according to the creators, will be hacked. User privacy comes first.

The use of SAFE technology will allow rebuilding the traditional way of storing user information. For example, the achievements of modern systems in the field of voice recognition, video images never cease to amaze the human imagination. However, this is a cause of concern for users for the safety of personal data. The SAFE network employs a technology in which the user creates an account without intermediaries. There is no need to store passwords in the system. This is what prevents the risk of password theft, and at the same time the ability of third parties to access confidential information.

SAFE Network is an open source network. The goal of this approach is to create a resource that provides any network user with the opportunity to disseminate data on the Internet and gain access to the exchange of information with other people around the world.

An equally interesting project, the development of which has been going on for many years, is the Solid organization. Solid technology implements the possibility of end-to-end document editing, data management system and their updating through WebSockets. The idea of forming a single Internet space, formulated 15 years ago, now has the opportunity to be realized.

Solid technology is a joint development of Tim Berners-Lee, creator of the World Wide Web, with a group of researchers from the Massachusetts Institute of Technology [4]. According to the developer, the Internet has deviated from its original direction in its development. The situation in which he is now can be considered critical, since the network has long turned into a trading platform where profit-making has come to the fore.

The concept of the Internet was initially to create a public platform for creativity and the development of creative innovative products. The first popular browser, Mosaic, contained multimedia and editing tools. Subsequently, these tools were removed as they seemed too complex for the average web user. This is what served as the starting point for changing the Internet.

Solid technology aims to restore balance in the environment for the distribution and storage of confidential data. In most cases, users do not know for what purpose one or another information that they provide while using the Internet is used. Consequently, such situations give rise to cases where sensitive data is no longer stored properly and becomes public. Solid is committed to correcting and preventing these situations from occurring.

Solid technology assumes full user control over their data. A person can independently impose restrictions on the storage and use of personal information. According to the ideas of the technology under consideration, all user data will be stored in one place and a person will always know where, when and by whom his confidential information is requested. It is with the storage of all data that various applications will interact. Solid is considered as an ecosystem for storing information in all possible forms [1].

Monopolization of the Internet space has always been a consequence of the desire of technology companies to make huge profits. This leads to the fact that the network is considered only as a trading platform. The Internet is no longer a platform for developers to create joint projects and an independent space in which each user can be heard and get the opportunity to realize their creative potential. The Internet has become a platform dominated by advertising. Recently, this problem has become especially acute, because the issues of profit associated with the monopoly of large enterprises do not provide an opportunity for the growth and development of innovative products.

That is why companies that are developing ways to reorganize the Internet and revise the vector of its development are attracting more and more attention.

Thus, the Internet as a free space is the ideal that the information society should aspire. Thanks to the developments of the companies discussed in the article, a new vector is outlined in the development of the World Wide Web is emerging.

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**ИНТЕЛЛЕКТУАЛЬНАЯ ИЗМЕРИТЕЛЬНО-ИНФОРМАЦИОННАЯ СИСТЕМА В  
АКВАТОРИИ ЧЕРНОГО МОРЯ С ИСПОЛЬЗОВАНИЕМ LORAWAN  
INTELLIGENT MEASURING AND INFORMATION SYSTEM  
IN THE BLACK SEA USING LORAWAN**

**Аннотация.** Цель статьи – решить проблему с передачей данных от измерительных буйёв к серверу, что обеспечивает контроль гидрологических параметров прибрежных акваторий. Представлен более эффективный способ передачи данных между измерительными буйами и сервером, что позволяет повысить возможности создания интерактивной системы между измерительными буйами, в том числе и в режиме ЧС. Рассмотрен метод сбора и передачи информации, измерительных буйев в режиме онлайн с использованием разработки LoRa и сети LoRaWAN. Приведены схемы передачи данных. Таким образом, если в данной задаче использовать технологии LoRa и сеть LoRaWAN для передачи данных, то клиент имеет возможность прозрачной, двунаправленной, дальностой и защищенной передачи данных до конечного устройства.

**Abstract.** The purpose of this article is to solve the problem of data transmission from measuring buoys to the server, which ensures control of hydrological parameters of coastal waters. A more efficient way of transferring data between measuring buoys and a server is presented, which makes it possible to increase the possibilities of creating an interactive system between measuring buoys, including in emergency mode. A method for collecting and transmitting information, measuring buoys online using the LoRa development and the LoRaWAN network is considered. Data transmission schemes are given. Thus, if in this task we use LoRa technologies and the LoRaWAN network for data transmission, then the client has the ability to transparent, bi-directional, long-range and secure data transmission to the end device.

**Ключевые слова:** LoRa, LoRaWAN, телекоммуникация, интерактивная система, измерительные буйи.

**Key words:** LoRa, LoRaWAN, telecommunications, interactive system, measuring buoys.

At the moment, many measuring monitoring systems use an outdated architecture in which measuring devices (endpoints) exchange information directly with the main server via GSM cellular communication at a certain time interval. That is, a lot of data may be lost over this period of time and we will not have accurate measurement results. The report gives an example of the use of LoRa development for data transmission between measuring buoys near the coast of the Sevastopol Bay and Crimean water bodies. This technology provides a long range, as well as savings in communication costs and energy consumption.

To control the hydrological parameters of coastal waters, a group of measuring buoys is used (see Fig. 1).

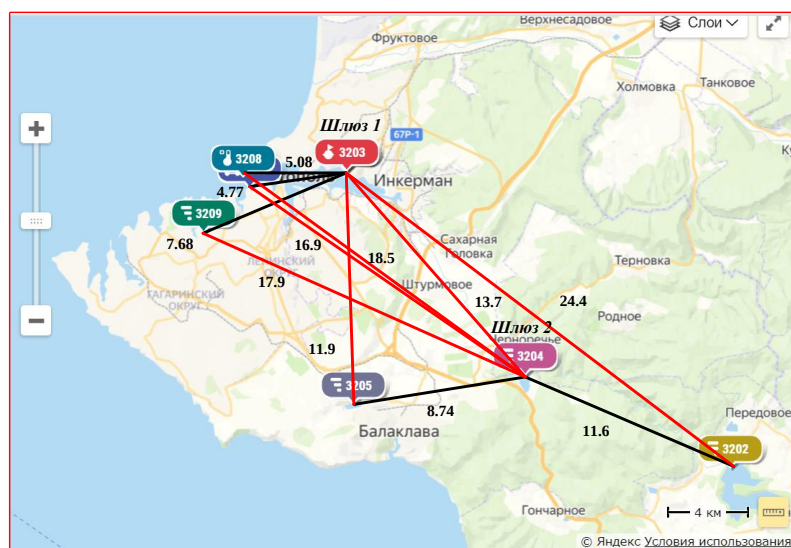


**Figure 1.** Layout of measuring buoys and LoRaWAN gateways

LoRaWAN uses a stellar network architecture, so the end devices (measurement buoys) in the LoRaWAN network communicate directly with the gateways and only work when they need to communicate with the gateway, since the communication range is not an issue. Considering the range of 15–20 km, it was decided to install 2 locks for communication with the rest of the buoys (see Fig. 1).

The gateways are connected to the network server through standard IP connections that relay messages between the back-end of the central network and end devices using a single-hop wireless protocol. They are designed to support bi-directional communication and are equipped with multicast transmission, which allows software to send bulk messages such as over-the-air updates.

To ensure the IP connection, the coverage of the Sevstar Internet provider will be used. Figure 2 shows that the coverage fully covers the areas we need.

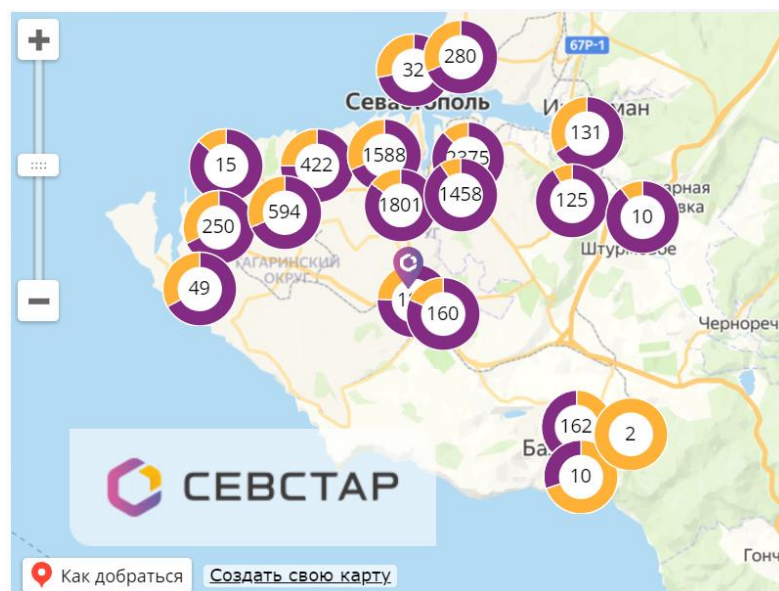


**Figure 2.** Sevstar coverage map

Gateway 1 connects to a Wi-Fi router located in the village of Holland, and Gateway 2 connects to a Wi-Fi router located in Balaklava.

If one of the gateways is unavailable for some reason, the measuring buoy connects with the second gateway and transmits information to it. If the gateways do not work, then the buoy will store

the information in the backup memory and when the connection is established it will transfer the data to the first gateway that connects to it.

Thus, the scheme of communication of measuring buoys with a client online using the LoRa development is considered.

The possibility of minimizing the cost of communication with buoys and energy consumption for data transmission from measuring buoys to end users has been revealed.

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## СРАВНИТЕЛЬНЫЙ АНАЛИЗ АВТОМОБИЛЬНЫХ КОМПЬЮТЕРНЫХ ОПЕРАЦИОННЫХ СИСТЕМ THE COMPARATIVE ANALYSIS OF ON-BOARD CAR COMPUTERS' OPERATING SYSTEMS

**Аннотация.** В статье рассматривается специфика программного обеспечения для бортовых компьютеров в автомобильной промышленности. Автор исследует основные особенности популярных операционных систем бортовых автомобильных компьютеров с целью сравнения их эффективности. Анализ проводится с использованием следующих параметров: удобство использования операционной системы, возможность и способы управления данными внутри автомобиля, совместимость ОС с марками автомобилей и мобильными устройствами. Для исследования отобраны операционные системы Ford Sync, Apple CarPlay, Android Auto, Automotive Grade Linux, Microsoft Windows Auto OS.

**Abstract.** The article is devoted to the analysis of software for on-board computers in the automobile industry. The author considers major features of popular Operating systems used in on-board car computers to compare their efficiency. The analysis is conducted using the following parameters: usability of the operating system, data management inside the car, compatibility of the OS with car brands and mobile devices. The researcher studies Ford Sync, Apple CarPlay, Android Auto, Automotive Grade Linux, Microsoft Windows Auto OS.

**Ключевые слова:** бортовой автомобильный компьютер, операционная система, совместимость, мобильные устройства, беспроводная связь.

**Key words:** on-board car computer, Operating system, compatibility, mobile devices, wireless connection.

Nowadays the development of automobile industry is one of the popular trends. Due to the availability of numerous car models and new technologies on the market high-quality on-board computers are in high demand.

An on-board computer is a small device used or installed in cars to processes and display the data, including [6]:

- trip and hour registration as part of tracking system statistics [7] (e.g., average speed, distance, fuel consumption (average rates, instantaneous), fuel level (up to a liter);
- air temperature in the cabin and outside;
- vehicle malfunctions;
- means of communication and other parameters [1].

All on-board computers are equipped with a special Operating system (OS) that is a mast controller for all the activities of the devices. The task of the research is to analyze the features of the programs used nowadays to compare their efficiency and usability. Each brand tries to generate its own OS to ensure its integrity and compatibility with cars. Volvo has announced recently the production of its Volvo Cars [5].

The following Operating systems were considered in the given study: Ford Sync, Apple CarPlay, Android Auto, Automotive Grade Linux, Microsoft Windows Auto. The types of OS were compared based on the parameters: usability, communication, applications required, connectivity with a mobile device and compatibility with various car models. The results of the analysis are given in the Table 1.

**Table 1.** The comparison of various OS for on-board car computers

| Parameters | Operating system                                |                                                       |                                                 |                                             |                                                 |
|------------|-------------------------------------------------|-------------------------------------------------------|-------------------------------------------------|---------------------------------------------|-------------------------------------------------|
|            | Ford Sync                                       | Apple CarPlay                                         | Android Auto                                    | Automotive Grade Linux                      | Microsoft Windows Auto                          |
| Usability  | Adapted for the use in smartphone s, there is a | Connected to the navigator, Wi-fi and voice assistant | Built-in navigator without voice assistant, the | Wi-fi, camera and audio signals support, no | Voice commands, navigation by gestures or using |

|                                     |                                                                                                                                   |                                                                                                                          |                                                                                                                                                                     |                                                                                     |                                                                                                                       |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
|                                     | voice assistant embedded.                                                                                                         | available, convenient music control, supports making calls without watching videos.                                      | possibility to listen to music from any source, to make calls and to watch videos, intuitive interface.                                                             | IVI control, climate control, navigation package format.                            | integrated steering wheel controls, Wi-fi, options to make calls, listen to music and watch videos.                   |
| Data management inside a car        | Continuous transmission of instructions, but information is passed through cables and wires, which reduce the transmission speed. | The car starts automatically via the phone, fast data transfer due to wireless connection, there is no Yandex.Navigator. | Built-in stereo system.                                                                                                                                             | Open-source code, steering wheel with audio controls.                               | Continuous transmission of instructions, but data are passed via cables and wires, decreasing the transmission speed. |
| Compatibility of OS with car models | Ford Focus, Mondeo, Ecosport.                                                                                                     | Audi, Acura, Bentley, BMW, Chery, Chevrolet, Citroen.                                                                    | Ford, Honda, Jaguar, Land Rover, Mazda, Mitsubishi, Nissan, Subaru, Suzuki, Toyota, Audi, Acura, Bentley, BMW, Chery, Chevrolet, Citroen, Volkswagen, Hyundai, etc. | Ford, Honda, Jaguar, Land Rover, Mazda, Mitsubishi, Nissan, Subaru, Suzuki, Toyota. | Honda, Toyota, Mazda, Hyundai, Renault, Citroen, Volkswagen.                                                          |
| Application software                | Software, application programs.                                                                                                   | Software, system, MAC OS, no special application required on the phone.                                                  | Does not require a specific application, may be connected to the OS of your smartphone.                                                                             | Functionality, safety, autonomous driving option, Bluetooth, CAN/LIN via USB.       | Bluetooth, software, application programs.                                                                            |
| Connectivity with a mobile phone    | Connected via USB cable,                                                                                                          | Connected via USB, Apple.                                                                                                | Connected via Android versions                                                                                                                                      | Connected via USB, Android versions                                                 | Connected via USB, Windows Phone.                                                                                     |

|  |                   |  |                         |                         |  |
|--|-------------------|--|-------------------------|-------------------------|--|
|  | Apple,<br>Android |  | (starting with<br>5.0). | (starting with<br>5.0). |  |
|--|-------------------|--|-------------------------|-------------------------|--|

The results of the comparative analysis show that Ford Sync [3] and Apple CarPlay [4] are compatible with a small variety of car brands, and the second OS has limited functionality in terms of connectivity to a mobile device, besides, it is adapted only for Apple phones. We may draw a conclusion, that the most efficient options are Android Auto [2] and Microsoft Windows Auto. But due to the fact that the latter also has a Windows Phone connection only, Android Auto is better adapted software among all OS types and meets the demands for innovation. Moreover, with the constant updating of the Android OS for the mobile devices, the software of on-board computers will add new features automatically.

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## **ГУГЛ ФОРМЫ И ДРУГИЕ ОБЛАЧНЫЕ СЕРВИСЫ ГУГЛ GOOGLE FORMS AND OTHER GOOGLE CLOUD SERVICES**

**Аннотация.** В современном мире информационные технологии развиваются с невероятным темпом. Люди разных возрастов все чаще используют компьютеры и интернет в работе и учебе, и благодаря различным онлайн-сервисам повседневные действия становятся более простыми в осуществлении. Задача данной статьи- разобраться в одном из инструментов для создания опросов-Гугл-формы. Изучив основной функционал этого приложения, можно сказать, что Гугл-формы имеют более широкий спектр возможностей, чем может показаться на первый взгляд, и поэтому сильно опережают конкурентов. Гугл формы в то же время не сложные в освоении. Они являются наиболее удобным инструментом для частого пользования. Если заранее продумать структуру и логику опросника, то форма станет эффективным средством для привлечения клиентов или тестирования сотрудников, а также для проведения промежуточной аттестации и контрольных работ в школах и университетах.

**Abstract.** In the modern world information technologies are developing at an incredible pace. People of different ages are increasingly using computers and the Internet for work and study, and thanks to various online services, everyday actions are becoming easier to implement. The purpose of this article is to understand one of the tools for creating surveys-Google forms. Having studied the basic functionality of this application, we can say that Google forms have a wider range of features than it might seem at first glance, and therefore are far ahead of competitors. Google forms at the same time are not difficult to master. They are the most convenient tool for private use. If you think through the structure and logic of the questionnaire in advance, the form will become an effective means for attracting customers or testing employees, as well as for conducting various tests and exams in schools and universities.

**Ключевые слова:** Гугл-формы, Веб-службы Гугл, система облачных сервисов Гугл, приложения Гугл, Майкрософт офис.

**Key words:** Google-Forms, Google-Workspace, Google cloud-services system, Google-Apps, Microsoft Office.

Google Forms is an online tool that allows people to create forms for data collection, online testing, and voting (Figure 1). Each form in Google Forms is a web page that hosts a questionnaire or quiz.



**Figure 1.** The Google Forms logo

Google forms can be used for both personal and business purposes, for example:

- conducting surveys;
- organization of online research;
- registration of event participants;
- getting feedback from customers;
- collecting reviews;
- conducting tests and quizzes;
- collecting contacts for mailing lists.

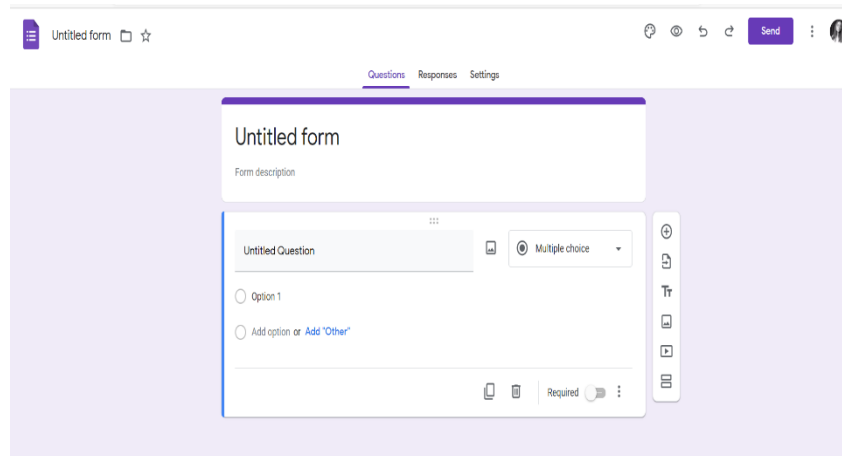


**Figure 2.** Getting started in Google Forms

There are two ways to get started in Google Forms, and both of them require the G-mail account from Google [1; 2]. According to the first method, it is needed to go to the Google start page, click the applications menu in the upper-left corner of the screen and click on your Google Drive. After opening the service, the “create” button will be available at the top, and then “Google forms”. At this stage it becomes possible to create an empty form or use a template (see Figure 3). Another option for creating a Google form is to register it in the browser’s address bar “form.new”. This will create a similar form as in the first method (Figure 4).

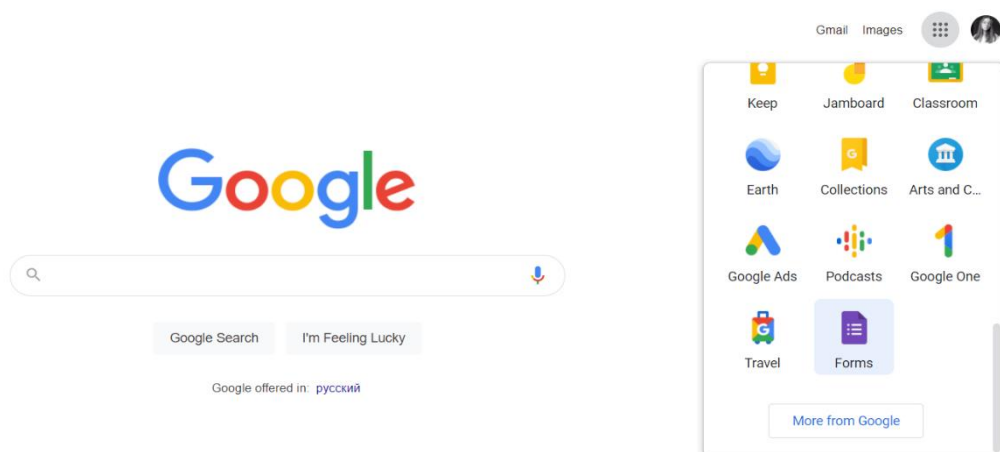


**Figure 3.** Method for opening Google forms number 1

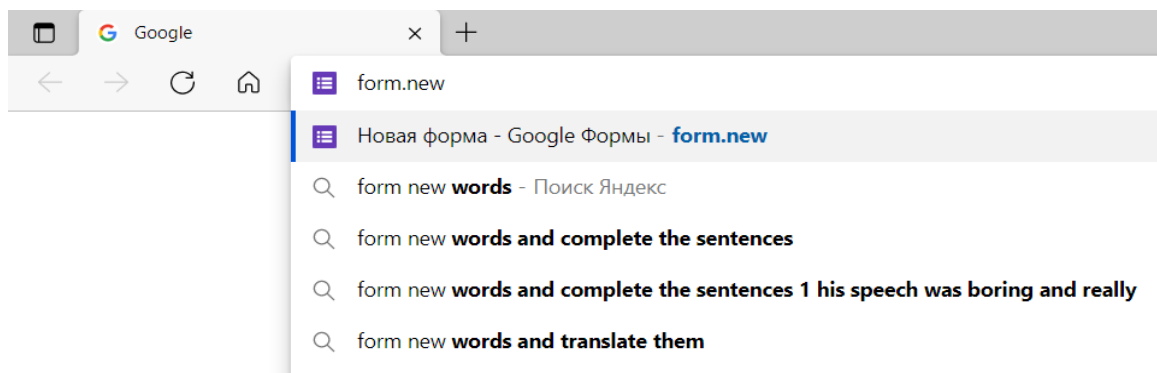


**Figure 4.** Method for opening Google forms number 2

So, when working with Google forms, the developer is provided with a constructor of forms (surveys) that are saved on Google Drive.

The form uses different types of questions:

- Text. The respondent is asked to type a short answer.
- Test (paragraph). The respondent adds a detailed response.
- One of the lists. The respondent is asked to choose one answer option from several suggested options.
- Several from the list. The respondent can specify several response options for their own choice.
- Drop-down list. The respondent selects one option from the drop-down menu.
- Scale. The respondent should give a rating on the suggested numerical scale (for example, from 1 to 10).
- Grid. The respondent selects certain points in the grid, which consists of rows and columns.
- Date. The respondent specifies the date using the built-in calendar.
- Time. The respondent chooses the exact time or time interval.

To prevent respondents from missing mandatory questions, some questions can be marked with a special flag. In addition, there is an opportunity to set a ban on re-filling out forms.

Forms can be divided into sections to group questions with the same subject and make the survey more convenient [3; 4].

The finished form is sent to respondents via email, or by publishing the link in social networks, or by embedding the link in the site page by adding the HTML-code. Most people prefer the second option, because it is the most convenient and easy way to deliver the form (Figure 5).

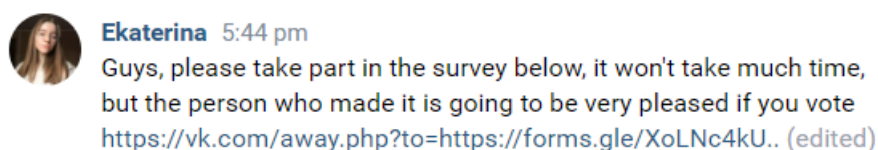


**Figure 5.** Example of delivering a Google form to respondents via the Vkontakte social network (Text: Guys, please take part in the survey below, it won't take much time, but the person who made it is going to be very pleased if you vote)

Statistics and responses can be viewed directly in the Google forms themselves, or in a separate spreadsheet that is created automatically by default. You can also specify a previously created one.

Google Forms are the most popular service of their kind, and there are many reasons for this. It is cross-platform, meaning it can be used on Personal Computers, laptops, tablets, phones, and any other possible gadgets. It has colorful design and allows users to choose suggested themes or create their own. Google forms have advanced, but at the same time easy-to-learn settings. Users can choose

the type of questions—from simple text boxes to complex scales and grids, add YouTube videos and photos to the form. There is also an opportunity to set up the form so that respondents end up on different pages depending on their responses. In addition, one of the advantages of the service is the ability of joint, simultaneous work with other people – it can be friends, classmates, or colleagues. Google Forms have automatic saving, as in all Google systems, which is also a great plus. All the main functionality is free, which also played a role in making Google Forms a leader among competitors.

Analogues of Google Forms are:

- WuFoo.
- Typeform.
- TimeSurvey.
- Formbakery.
- JotForm.
- Formulas.
- Ninja Forms, etc.

All the survey creation tools presented here have certain drawbacks: many quiz templates are not appropriate for users' goals, are too expensive, or do not have automatic calculation of survey results.

It is worth mentioning that Google Forms are just a part of the whole Google cloud services system, called Google-Workspace. Service Google-Workspace, which started its existence back in 2006, supports several web applications with similar functionality as in traditional office packages (Figure 6). It includes Gmail, Google Calendar, Google Drive, Google Docs, Google Sheets, Google Meet and Google Forms. Google services have an advantage over other services, as a person can access any service that is part of Google under one account.



**Figure 6.** Logos of the most popular services Google-Workspace

Generally, Google Workspace is a worthy analog of Microsoft Office. Mainly, Google services are used by small businesses that, for some reason, do not have the opportunity to buy a license, but now more and more people start using Google-apps in daily life since these apps are superior to others in many aspects.

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## **НЕОБХОДИМОСТЬ ИННОВАЦИОННОГО РАЗВИТИЯ И ТЕХНОЛОГИЧЕСКОЙ МОДЕРНИЗАЦИИ ГОРОДА СЕВАСТОПОЛЯ THE NEED FOR INNOVATIVE DEVELOPMENT AND TECHNOLOGICAL MODERNIZATION OF THE CITY OF SEVASTOPOL**

**Аннотация.** Статья посвящена необходимости инновационного развития и технологической модернизации города Севастополя как основы для наращивания конкурентных преимуществ, создания благоприятного инвестиционного климата и повышения предпринимательской активности города. В заключении делаются выводы относительно ключевых проблем в сфере инновационного развития г. Севастополя, к которым относятся: ограниченность объемов финансирования науки; отсутствие альтернативных источников инвестиций в науку, кроме средств государственного бюджета; различные административные проблемы, связанные со сложностью организации и ведения бизнеса; практически полное отсутствие элементов инновационной инфраструктуры; санкции и вытекающие ограничения на международную торговлю и международное движение труда и капитала; низкий уровень кооперации науки и производства в регионе; низкая предпринимательская активность и инновационная культура трудоспособного населения.

**Abstract.** The article is devoted to the need for innovative development and technological modernization of the city of Sevastopol as a basis for building up competitive advantages, creating a favorable investment climate and increasing entrepreneurial activity of the city. Finally, conclusions

about the key problems in the field of innovative development of the city of Sevastopol are drawn. The following problems are highlighted: limited funding for science; lack of alternative sources of investment in science, except for the state budget; various administrative problems associated with the complexity of organizing and doing business; almost complete absence of elements of innovation infrastructure; sanctions and the resulting restrictions on international trade and international movement of labor and capital; low level of cooperation between science and industry in the region; low entrepreneurial activity and innovative culture of the working-age population.

**Ключевые слова:** инновационное развитие, технологическая модернизация, уровень развития, город Севастополь, Российская Федерация.

**Key words:** innovative development, technological modernization, level of development, Sevastopol, Russian Federation.

The transition from an export-raw-material model of development to an innovative one is one of the priority directions of economic development in Russian regions, and innovative development, in turn, is one of the key points of economic growth in a competitive environment. One of the fundamental aspects of the development of cities, regions, and countries in general, is innovation.

Timely identification of the region problems, the use of existing prospects for innovative development and technological modernization of the city will help to increase the competitiveness of the subject, which is especially relevant at the moment of the socio-economic formation of the city. The purpose of the article is to study the problems of innovative development and technological modernization of the city of Sevastopol.

Sevastopol is a city located on the Black Sea coast, in the southwest of the Crimean Peninsula. There is a non-freezing sea fishing and commercial port in Sevastopol and it is a recreational, scientific and technical, industrial, cultural and historical center as well. The main naval base of the Black Sea Fleet of the Russian Federation is also located in Sevastopol. Over the course of two years, the Crimean economy, despite the efforts made by the Russian leadership, has undergone new negative impacts. In addition to the painful period of adaptation, there were also added sanctions from the leading countries of the world.

Innovation activity is an integral part of the development strategy of Russian regions, as it creates conditions for both the creation of high added value and for socio-economic development, which is a key competitive advantage of the region. Innovation activity, in the main directions of the Russian Federation policy in the field of innovation system development, is defined as the provision of services and (or) performance of work, which have such directions as the creation and modernization of new or existing methods (technologies) of its production, creation, use, and distribution [4, p. 27].

We believe that the development of sectors of the national economy should be based on technological innovation. The state, on the basis of innovations of those industries that are traditional for the region, correspond to the emerging technological order and have significant development potential, must support modernization processes. An important benchmark for technological modernization, which is a contradictory and complex process, is the level of technological lag, since technological modernization of only certain breakthrough industries will not lead to the recovery of the entire industry.

Since in modern conditions, technological modernization is impossible without research and development and innovation, such concepts as research and development, innovation and technological modernization are interconnected.

Russia is currently implementing a wide range of measures in the direction of technological modernization. However, there are many obstacles that impede the confident implementation of development and research work and the development of innovative production methods. In the city of Sevastopol, there is insufficient effective stimulation of high-tech activities, which does not

contribute to an increase in demand for manufactured products and leads to a technological backwardness of the economy.

To ensure the harmonious development of the Republic of Crimea and the city of Sevastopol, two areas of action in the field of integration of Sevastopol into the Russian Federation can be distinguished:

- Urgent issues, the solution of which is necessary to maintain the branches of the Republic of Crimea and the city of Sevastopol in connection with the disruption of the previous financial, economic and infrastructural ties.
- The need to improve the competitiveness and modernization of the sectors of the economy of the Republic of Crimea and the city of Sevastopol.

Technological modernization of the city of Sevastopol should be carried out in parallel with the neutralization of the factors hindering the development of domestic industry, since this process requires the purposeful organization of the activities of all elements of the regional socio-economic system.

Depreciation of fixed assets and a significant shortage of cash is currently the most critical factor affecting technological modernization.

While the commissioning of new means of production in 2019 amounted to only 0.9% of the total, the depreciation of fixed assets in manufacturing was 46.7%, which, of course, does not fundamentally change the situation.

The financial aspect becomes the primary reason for the unsatisfactory position of domestic producers in the context of systemic restrictions on economic development, thereby causing virtually unchanged production volumes, low availability of modern means of production and a shortage of highly qualified labor force.

Further, an analysis of the processes of introducing scientific developments and new ideas into production will be carried out, that is, directly the innovative activities of enterprises and organizations. The level of innovative activity of organizations is presented in Table 1.

**Table 1.** The level of innovative activity of organizations, 2019

| Region                    | Share of organizations participating in joint research and development projects |                          | Aggregate level of innovation activity |                          | Volume of innovative goods, jobs, services |                          |
|---------------------------|---------------------------------------------------------------------------------|--------------------------|----------------------------------------|--------------------------|--------------------------------------------|--------------------------|
|                           | <i>sphere of production,%</i>                                                   | <i>services sector,%</i> | <i>sphere of production,%</i>          | <i>services sector,%</i> | <i>sphere of production,%</i>              | <i>services sector,%</i> |
| Russian Federation        | 3,3                                                                             | 3,8                      | 10,60                                  | 7,3                      | 3403035,3                                  | 735344,5                 |
| Southern Federal District | 1,6                                                                             | 2,5                      | 10,70                                  | 7,30                     | 258326,4                                   | 41162,7                  |
| Republic of Crimea        | 1                                                                               | 2,4                      | 5,30                                   | 2,40                     | 1117,1                                     | 290,4                    |
| Sevastopol                | -                                                                               | 6,1                      | 6,30                                   | 2,00                     | 730,4                                      | 3,1                      |

In general, in the Russian Federation in 2019, almost 255 thousand advanced technologies were used. Moreover, for the five-year period 2015–2019, the growth rate for the city of Sevastopol was + 114.6% (221 technologies in 2019). The volume of industrial innovative goods, jobs, services in the city of Sevastopol amounted to 730.4 million rubles, which is, respectively, only 0.03% and 0.02% of the all-Russian indicator. In the service sector in 2018, the volume of innovative goods, jobs, services in Sevastopol is 3.1 million rubles, which is 0.04% and 0.0004% of the all-Russian indicator, respectively.

Thus, we can see that the city of Sevastopol and the Republic of Crimea make an insignificant contribution to the volume of innovative products, while the city of Sevastopol lags significantly

behind in terms of the number of innovations in the service sector.

According to the Decree of the Government of Sevastopol of 13.10.2016 N 955-PP “On the approval of the State program of the city of Sevastopol: Development of the industry of the city of Sevastopol for 2017–2022” it is assumed:

- industrial enterprises modernization and technical re-equipment of the city of Sevastopol and achieving their maximum load;
- increasing the volume of production in the manufacturing industry in physical and value terms (from 104% to 107% annually);
- by the end of 2022, it is planned to modernize 12 industrial enterprises, which will make it possible to achieve the share of products of knowledge-intensive and high-tech industries in the gross regional product by 34.8%;
- an increase in the gross regional product in the manufacturing industry by 2022 to 9,400 million rubles [2].

In manufacturing, the region's gross regional product was 6833.5 million rubles in 2017, 6,886.0 million rubles in 2018 and 6,913.2 million rubles in 2019, that is, there is no significant growth (by 0.76% in 2018 and by 0.81 in 2019 compared to the previous year). These data confirm the need for technological modernization of Sevastopol enterprises using innovations.

Targets otherwise will not be met. It should also be noted that there are no official statistics on the implementation of the program under consideration.

The city of Sevastopol, according to the rating of the constituent entities of the Russian Federation according to the value of the Russian regional innovation index of 2019, takes 58<sup>th</sup> place with an index of 0.3 among 85 constituent entities [1, p. 32].

Therefore, there is no doubt about the need to increase research and development costs.

Table 1 shows the growth rates of internal spending on research and development in the constituent entities of the Russian Federation, which should contribute to the development of innovation and technological modernization of the city of Sevastopol.

**Table 2.** Growth rates of internal current expenditures on research and development in the constituent entities of the Russian Federation (%)

| Region                    | Total  |        |        |
|---------------------------|--------|--------|--------|
|                           | 2017   | 2018   | 2019   |
| Russian Federation        | 102,28 | 108,75 | 115,34 |
| Southern Federal District | 97,85  | 97,28  | 97,63  |
| Republic of Crimea        | 121,22 | 109,27 | 109,67 |
| Sevastopol                | 104,30 | 126,13 | 129,14 |

As we can see from the Table 1, current costs are decreasing in the Russian Federation, in comparison with the world innovation leaders; however, in the Russian Federation as a whole they tend to grow, while in the Republic of Crimea and the city of Sevastopol these costs have been decreasing in recent years [3, p. 101].

Thus, the analysis of scientific, technical and innovative activities reveals the following problems (factors of adverse impact) in the field of innovative development of the city of Sevastopol:

- limited amount of funding for science: an additional risk is associated with the lack of alternative sources of investment in science (90% of funds come from the state budget);
- complexity of organizing and running a business, which hinders the creation of small innovative enterprises (bureaucratization, difficulty in obtaining benefits for innovative enterprises, imperfect regulatory framework, etc.);
- absence of elements of innovation infrastructure: technology parks, business incubators, venture funds, private investors willing to invest in science and innovation, etc.);
- sanctions, which give rise to problems associated with the complexity of international scientific and business cooperation, official supplies of foreign equipment, entering the international market, etc. (that is, problems arising from restrictions on international trade and the international



movement of labor and capital);

– low level of cooperation between science and industry in the region, because the region does not develop territorial forms of scientific and industrial cooperation (technology parks, scientific and industrial clusters, etc.).

Thus, the problems identified in the study determine the directions of both the state and corporate structure activities to eliminate the backwardness of technological modernization and innovative development of the city of Sevastopol, which are considered from the point of view of the role they are called upon to play to bring Sevastopol to a new level of development. The government of the Russian Federation should pay attention to the unpreparedness and backwardness of the city of Sevastopol from other regions and do work to eliminate the shortcomings and threats to the further development of the hero city of Sevastopol.

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## **INDOOR NAVIGATION BASED ON MARKER TECHNOLOGY ВНУТРЕННЯЯ НАВИГАЦИЯ НА ОСНОВЕ МАРКЕРНОЙ ТЕХНОЛОГИИ**

**Аннотация.** В данной статье говорится об исследовании возможности внутренней навигации с применением дополненной реальности. В работе приводится краткое описание мобильного приложения, разработанного автором статьи. Задача представленного программного продукта – построение маршрута внутри помещения с использованием маркеров, благодаря которым удаётся установить нулевую позицию. Разработчик описывает особенности и алгоритм работы приложения. Подчеркивает необходимость его совершенствования и также раскрывает перспективы использования в СевГУ.

**Abstract.** This paper is about a research of internal navigation based on augmented reality. The paper describes a mobile application created by the author. The task of the presented software product is to build a track inside a room using markers, due to which it is possible to set a zero position. The developer describes the application and its work algorithm. He stresses the need for its improvement and also reveals the prospects of its use in SevSU.

**Ключевые слова:** внутренняя навигация, дополненная реальность, маркерная технология, маркеры, мобильное приложение.

**Key words:** indoor navigation, augmented reality, marker technology, markers, mobile application.

In the age of modern technology, there are many navigation applications based on the Global Positioning System (GPS) technology. But despite their extensive range of advantages, they also have their drawbacks. The main reason of it as they are not good for indoor navigation. As the satellites cannot determine exactly which direction a person needs to go if he/she is inside a building. For instance, the fifth floor and the ground floor are the same things for the GPS. Therefore, there must be other approaches to solve the problem of indoor navigation. One modern solution is Augmented Reality-based Navigation.

There is now a considerable amount of evidence that the GPS navigation is an ineffective tool for indoor positioning. Some of the current research generally shows that the GPS signal is weak inside a building. More specific data indicates that due to reflections from walls, the GPS almost always gives an out-of-building signal, no matter where the user is located.

But it should be noted that the exception is wooden houses with thin walls where the GPS works particularly well. The other exception is locations plotted on Google or Apple maps, where native positioning performs appropriately (but it is limited to some major airports, stadiums, etc.) [2].

Kaveh Pahlavan, a professor of Electrical and Computer Engineering at Worcester Polytechnic Institute in Massachusetts, says that “Indoor navigation is very tricky and challenging” [1]. As a director of the Center for Wireless Information Network Studies, he has closely

followed the various radio-based positioning methods that have emerged over the years and observed how these technologies have evolved. Progress depends not only on technical promises but also on the realities of marketing. “The fact is whatever the technology industry chooses to focus on has a big impact,” he says [1].

Many are familiar with technologies such as augmented reality, but few are aware that there are a range of ways to use these technologies. For example, augmented reality can be based on marker technology or object tracking.

Here we are going to show how the problem of indoor navigation can be tackled. For this purpose, we created an “Easy Way” (*Лёгкий путь*) mobile application based on marker technology.

We consider it is essential to review several key elements at the beginning, such as “zero marker”, “zero position”, “image”. A clear comprehension of their meanings will help better grasp the concept of the developed application. “Marker” is defined as a ready-made “image” that assists to construct the augmented world. Zero position is point of augmented world with zero coordinates. It is used to construct augmented world because process of constructing starts from this point.

This research considered different ways of using augmented reality for indoor navigation. But it is important to note that there are two most popular ways to develop a mobile application based on augmented reality. The first one is the game engine Unreal Engine 5. It has built-in program instruments for work with augmented reality. The second one is the game engine Unity 3D. It has no built-in program instruments for work with augmented reality but there are many open source codes. Also, there are various tutorials. That is the reason why the effective decision was to use Unity 3D [3].

One of the effective program libraries for developing a mobile application using Unity 3D based on augmented reality is AR Core. It allows using markers like zero position as it mentioned above. A user just needs to scan a marker like scanning a QR code. And it provides him/her with an augmented world that points the way to his destination. Images created for scanning had to be different so that the software could distinguish them. Obviously, the number of images can be unlimited. For example, 1 billion markers. It depends on the purpose of the programme itself.

But in this research just different colourful and geometric shapes were applied in order to avoid recognition problems. The developer only created four images, as this was enough to design the demonstration application.

Further, we encourage to review the results of our work in more detail. As it was announced, the main function of this application is to help users find their destination with ease, as the application has a simple workflow. It is important to add that the area of Sevastopol State University (SevSU) was chosen as the site for the developed programme.

The Figure 1 shows the algorithm of operating procedure of the application “Easy Way”.



**Figure 1.** The application workflow

Figure 1 shows the main steps of the application. First, the user should press the 'Go' button on the home screen. This is to make sure that the user actually intends to run the application and has not launched it by accident.

Secondly, the user should find at least one marker. This functions as a starting point or zero point. This is why it is so vitally important to find a marker and scan it with the application.

Thirdly, the user has to select a destination. The application provides a list of available destinations in the form of a drop-down menu. Once the user has selected a destination, the 'Construct Route' button needs to be clicked.

Fourthly, the user has to follow special 'balloons' that lead them to their required location. When the user reaches the final balloon, he/she is notified about it. After that, the user can choose another available path.

Despite the obvious pros of the app, it also has a number of cons. On the one hand, it has environmental independence, the ability to function in enclosed spaces, and ease of use. But on the other hand, the user has to search for markers in order to synchronize physical and virtual worlds to create augmented world and this can be difficult because markers could be destroyed or damaged.

The prospects of improving this application are evident. They are related to the refinement of existing features as well as the design of new ones. For example, a 'language selection' option for use by foreign users.

To summarize, we can say that the possibility of using augmented reality based on marker technology for indoor navigation at SevSU was investigated. A mobile application was created to implement augmented reality-based indoor navigation.

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### **ИСПОЛЬЗОВАНИЕ ТЕХНОЛОГИИ ТРАССИРОВКИ ЛУЧЕЙ В РЕАЛЬНОМ ВРЕМЕНИ USE OF REAL-TIME RAY TRACING TECHNOLOGY**

**Аннотация.** В данной статье представлен обзор принципов трассировки лучей как технологии рендеринга. Автор рассматривает преимущества и недостатки данного метода в сравнении с более распространённым методом растеризации, а также рассказывает про последние разработки в сферах программного и аппаратного обеспечения,

специализированных на трассировке лучей. Для анализа дальнейшего роста использования данной технологии автор приводит примеры её использования в компьютерных играх. В статье также анализируются методы прорисовки изображения, способные повысить производительность не только при использовании специализированной, дорогостоящей аппаратуре, такой как видеокарты RTX от компании NVIDIA.

**Abstract.** This article provides the basic principles of ray tracing as a rendering technique. The author discusses the advantages and disadvantages of this method compared to the more common ray tracing method. The author also focuses on recent developments in ray tracing software and hardware. Some examples of its use in computer games to analyse further growth of the technology are given. The article also analyzes the modern technology that can improve the performance of raytracing rendering not only for higher-end, specialized hardware, such as NVIDIA's RTX graphical processing units (GPU's).

**Ключевые слова:** трассировка лучей, трассировка пути, рендеринг, технологии, трассировка лучей в реальном времени, компьютерная графика

**Key words:** ray tracing, path tracing, rendering, technology, real-time ray tracing, computer graphics

Computer graphics has become a necessity in modern-day life, as it's used to create an image that depicts something in one way or another, including stylized or realistic images, or delivers a message. Ray tracing render method is, currently, the most realistic rendering method for computer-generated imagery, as it can simulate how light behaves in real-world situations with remarkable precision. Although, as good as it sounds, it also has an immense requirement for processing power, because it has to calculate millions upon millions of rays, and on top of that, they bounce off objects, and this takes a lot of time, unlike a more subtle and less resource-intensive method, such as rasterization, which generates a raw image, and then enhances it with additional effects by using existing render information such as image depth or object textures.

The idea of ray tracing was invented in 1968, by Arthur Appel, but suggested for visualization only in 1979 by Turner Whitted in his work "An improved illumination model for shaded display" [4]. It's based on generating rays from the observer's point of view, with just one ray per pixel on-screen that tries to find the closest object that prevents it from going any further. And when this "raycasting" algorithm accounts for the object material, and sources of illumination near the object, it can calculate the object's shading. One of the first uses of this technology was for a videogame was by a company named "id Software", in their classic game "Wolfenstein 3D" and later, though partly, "DOOM", to make their two-dimensional games appear three-dimensional, despite the very limiting capabilities of hardware at the time.

Raytracing, which was invented as a concept a bit later, in 1968, uses raycasting to determine the first collision rays make, and produces multiple rays from the collision point to simulate light bounce to return the end color values after a limited number of bounces and generate a photorealistic image that is as close to real-world as possible. But this method was extremely resource-intensive at the moment, and hardware didn't have even a fraction of what it took to run this rendering technology in real-time mode, so something else had to be invented.

One of the methods that were discovered was pathtracing, by James Kajiya in 1986, which he published in his work named "Rendering equation" [2]. This method was an improvement over raytracing, which partially randomized the bounce direction, by having just two bounce variants generate and make the ray choose between them, for rays instead of exponential ray generation. Very often a bounce limit is also introduced, which does not allow rays to bounce more than a set number of times, which can be implemented on a per-material basis.

This something was rasterization (a method that's opposite to vectorization), which was a go-to tech for a long time, mainly for its unmatched performance in comparison to raytracing and raycasting. It used, and still uses a lot of clever tricks such as anti-aliasing, or checkerboard rendering to look acceptable and retain its supreme performance.

But in the modern day, raytracing can be affordable, even on the older hardware. A recent video game release, "Teardown", according to user claims, performs remarkably well even on computers which hardware is significantly weaker than the ones stated in standard and recommended hardware requirements (a quad-core central processing unit (CPU), 4 gigabytes of random access memory (RAM), and a GPU not weaker than an NVIDIA GeForce GTX 1060 with 3 gigabytes of video random access memory (VRAM)). One of the major performance variables in this situation is that this game uses voxel to render its world and 3D objects, as opposed to more traditional ways that use models and textures. This alone improves the performance significantly, due to an altered algorithm and reduced number of calculations required. In a benchmark made by a content creator "Kliksphillip", where he conducted testing on various GPUs by NVIDIA and AMD, the results were as follows including the model, similar models, manufacturer, graphics settings level, and frames per second (FPS). All tests were performed with a 1920x1080p monitor in full-screen mode.

- NVIDIA GeForce GTX 680 4 GB VRAM (similar ones are GeForce GTX 770, 960, 1050, AMD Radeon 7950, 270X, 460), 22–28 FPS with High settings, 26–34 FPS with Medium settings, 37–43 FPS with Low settings.

- NVIDIA GeForce GTX 940 4 GB VRAM (similar ones are GeForce GTX 1060, AMD Radeon 470, 540, 5500XT), 40–50 FPS with High settings, 45–55 FPS with Medium settings, 55–60 FPS with Low settings.

- NVIDIA GeForce GTX 1660 Super 6 GB (similar ones are GeForce GTX 1070, 2060 except the RTX cores, AMD Radeon Vega 56, 5600XT) 70–80 FPS with High settings.

- AMD Radeon 6870 1 GB VRAM, 7–10 FPS with High settings, 15–23 FPS with Medium settings, 30–36 FPS with Low settings.

- AMD Radeon 380 2 GB VRAM, 20–27 FPS with High settings, 37–42 FPS with Low settings.

- AMD Radeon 480 8 GB VRAM, 29–32 FPS with High settings.

This relatively high performance was achieved with multiple techniques, as well as the aforementioned way it uses to render the game world.

Those techniques are anti-aliasing, render scale, and limiting bounce count, which was described earlier.

Anti-aliasing is an entire family of algorithms that aim to make an image less rough and pixelated in a myriad of ways, ranging from upscaling the frame to a higher image resolution and then shrinking it back to native, or blending current plus one or two previous frames using motion vectors to smoothen the current one. For performance, the latter one, named Temporal Anti-Aliasing (TAA), is most commonly used.

Two other most recently developed methods, NVIDIA's Deep-Learning Super Sampling (DLSS) [3] and AMD FidelityFX Super Resolution (FSR) [1], are using more advanced upscaling algorithms. DLSS uses a real-time machine learning approach, which renders the image in a lower resolution, then upscales it using an image-enhancing artificial intelligence agent. Efficient, fast, works perfectly fine with raytracing, but requires additional work with the game developers to train the algorithm for a specific game, and is locked to only NVIDIA GPU's. FSR, on the other hand, is an entire pipeline of technologies, that includes contrast adaptive sharpening in which edges and details of the objects are more pronounced, a denoiser that is interpreted as a more potent version of TAA, and many others. It also works with virtually any even semi-modern GPU, unlike DLSS.

Render scaling is relatively simple: it renders the frame at lower image resolution, and then stretches it to match the native resolution, and finishing it up with one of many anti-aliasing methods, though again, the most common one is TAA. As the resolution is, undoubtedly, the major variable when it comes to performance, the use of this method is very widespread.

Checkerboard rendering, at its core, is a very clever method, despite being quite old by now. It's also related to anti-aliasing by how it works. When it is used to render a frame, it renders only half of it, by rendering every other pixel in a checkerboard pattern, thus the namesake. But when the next frame is rendered, it's shifted by a single pixel to the right or the left, filling the missing space, and making up the resulting image. Usually, some smoothing is also applied to the resulting image. It's quite hard to implement in the middle of the end of the development cycle, but it's extremely effective nonetheless.

As hardware performance grows, our methods should develop. However, we should not completely disregard optimization and assume that the hardware will over-power very complex, multi-level algorithms at the expense of performance alone, as this will only reduce their resulting computational power. The results of "Teardown" testing on multiple GPUs have proven that sophisticated techniques such as real-time ray tracing are feasible for anyone if given the time to polish and implement other rendering techniques that help improve frame rates in a variety of ways.

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**ИСПОЛЬЗОВАНИЕ ОНЛАЙН-ПЕРЕВОДЧИКА КАК ЭФФЕКТИВНОЕ СРЕДСТВО  
В РАБОТЕ С ДАННЫМИ НА ИНОСТРАННЫХ ЯЗЫКАХ  
USING ONLINE TRANSLATOR AS AN EFFECTIVE TOOL WHEN WORKING  
WITH DATA IN FOREIGN LANGUAGES**

**Аннотация.** В статье рассматривается проблематика использования машинного перевода при работе с текстовыми данными на иностранных языках. Актуальность данного исследования заключается в возрастающем интересе к онлайн-сервисам, что объясняется рядом очевидных преимуществ, которыми они обладают. С целью проведения тестирования популярных онлайн-переводчиков и определения качества их работы, автором произведена выборка статей и тестовых примеров на основе исторических фактов. В результате проведённого исследования автор предлагает определённый список рекомендаций для использования подобных онлайн-сервисов, а также собственную классификацию онлайн-переводчиков, составленную на основе качества перевода.

**Abstract.** The article discusses the problems of using machine translation when working with text data in foreign languages. The relevance of this study lies in the growing interest in online services, which is explained by a number of obvious advantages that they have. In order to test popular online translators and determine the quality of their work, the author has made a selection of articles, selection of test cases based on historical facts. As a result of the conducted research, the author offers a certain list of recommendations for using such online services, as well as his own classification

**Ключевые слова:** онлайн-переводчик, машинный перевод, технологии перевода, качество перевода, онлайн-словарь, иностранный язык.

**Key words:** online translator, machine translation, translation technologies, translation quality, online dictionary, foreign language.

Online translators are quite a popular phenomenon nowadays, and it's quite easy to explain: as a result of globalization, communication channels between countries have been established and even ordinary people have been able to communicate regardless of borders. Often an assistant in this case is similar to online services based on machine translation. It has become impossible for modern people to imagine life without the possibility of autotranslation. In this paper, we will test the most popular online translators to classify them by quality.

The urgency of this problem lies in the growing interest in online translators and working with data in foreign languages using such tools; since they are of sufficient quality, free, easy to use, and convenient and provide a large number of opportunities. The problematic issue is that online services often do not differ in the quality of translation. The practical significance lies in attracting public attention to the problem of machine translation and the need to check the products of automatic translation. The purpose of the work is to study the quality of auto translation.

Currently, the following services are the most popular among online translators: Google Translator (approximately 25 billion views per month [4]), Yandex.Translate – dictionary and online translation between English and over 90 other languages (hereinafter – Yandex.Translate) (approximately 62 thousand views per month [4]), Bing Microsoft Translator (approximately 6 billion views per month [4]), SYSTRAN Translate (approximately 841 thousand views per month [4]), PROMT.One Translator – dictionary and online translation into English, Russian, German, French, Spanish, Ukrainian and other languages (hereinafter – PROMT.One Translator) (approximately 1 million views per month [4]).

It was decided to test the quality of auto translation on popular online translators. To determine the quality of the translation, several test phrases were selected, taken from the press, in the plots of which people have already made mistakes when translating. The criterion for evaluating the correctness of autotranslation was a translation with preservation of meaning. The results showed that online service did not give one hundred percent translation quality. Standard errors are: ignorance of the translation of uncommon words, ignorance of the ambiguity of words, and more. For example, firstly, when translating from Japanese to English, online translators translated the word “黙殺” (transcription – Mokusatsu) as “smother” (Google Translator [3]), “silent death” (SYSTRAN Translate [6]), which fundamentally does not coincide with the original meaning of the word meaning “silence”, “no comments” or “to bypass silence”, this is due to the fact that online services translate these two characters separately, where the first (“黙”) means “silence”, and the second (“殺”) means “kill”. The same mistake was made by the US translators, it was this mistake that may have led to the atomic bombing of Hiroshima and Nagasaki [8]. Secondly, when translating from Spanish to English, the word “Intoxicado” was translated as “Intoxicated” (Google Translator [3], Yandex.Translate [10], Bing Microsoft Translator [2], SYSTRAN Translate [6]), which, although in everyday life are words with a similar meaning, but in some situations the difference in their meanings can be critical, since the Spanish word means food poisoning, poison or something of a similar kind, and its auto-translation is the effect of alcohol, narcotic or similar substances. This kind of mistake is also made in a real hospital, putting the patient's life at risk [9]. Thirdly, the phrase in Hebrew meaning “His face turned to rays” (“לִרְרִי הוּ יִי”) was translated by online servers as “His face turned to horns” (Google Translator [3], Bing Microsoft Translator [2], PROMT.One Translator [5]) or “His face turned into horns” (SYSTRAN Translate [6]), due to the fact that the last word of this sentence (“רִי”) is translated not only as “Horns”, but also as “Beam” or “Shine”. The same mistake was made when translating the Bible from Hebrew into Latin, which influenced the art of many masters of that time [7].

The most popular Google Translator and SYSTRAN Translate made the most mistakes. After analyzing the mistakes of online translators, we can make several recommendations: in addition to online services, use dictionaries, use several auto translations at the same time, use high-quality translators. However, it is worth noting that some online translators quite successfully cope with their tasks. Based on the results obtained, it can be concluded that Yandex. Translate and PROMT. One Translator has the greatest potential. And do not forget that online translators were created as assistants "Statistical machine translation cannot be compared with literary translation made by a professional translator. But it often happens that the user just needs to understand the basic meaning of the text ..." [10] – said Alexey Baytin, head of the Yandex service. Translation. From which it follows that you should never treat online translators as professional translation tools; since they were created to help a person, and not to replace them.

As a result of this work, we have figured out the phenomenon of the popularity of online translators, tested the most popular translators, classified online services, and compiled a list of recommendations for using auto translation. They also deduced that online translators, despite their simplicity, give the user a large number of opportunities.

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## **ИНФОРМАЦИОННАЯ БЕЗОПАСНОСТЬ И СПОСОБЫ ЕЕ ОРГАНИЗАЦИИ CYBER SECURITY AND STRATEGIES TO ORGANIZE IT**

**Аннотация.** В статье рассмотрены основные предметы и угрозы информационной безопасности сети Интернет и личных устройств пользователей, а также способы организации информационной безопасности на уровне организаций и уровне мировой арены. Представлены результаты индивидуального исследования на тему киберпреступлений и их классификации. В работе отражены потребности усовершенствования защитных компьютерных систем. Проведенная работа выявила, что бороться с киберпреступностью, подвергающей на данный момент опасности все сферы человеческой жизни, и защищать данные пользователей необходимо на мировом уровне путем постоянного взаимодействия стран между собой.

**Abstract.** The article discusses the main subjects and threats to the information security of the Internet and personal devices of users as well as ways to organize information security at the level of organizations and globally. The results of an individual study on cybercrimes and their classification are presented. The paper reflects the needs of improving security computer systems. The work carried out revealed that it is necessary to combat cybercrime, which currently endangers all spheres of human life, and to protect user data at the global level through constant interaction between countries.

**Ключевые слова:** киберпреступность, цифровая безопасность, информационное общество, протоколы безопасности, автоматические системы передачи информации.

**Key words:** cybercrimes, cyber security, information society, security protocols, automatic systems of transferring data.

Now it is the era of the information society when computers and telecommunication systems cover all spheres of human activity. However, humanity, putting itself in the service of telecommunications and global computer networks, did not foresee the possibilities for abuse of these technologies. Today, people and even entire states may be victims of criminals operating in the virtual space. At the same time, the security of thousands of users may be dependent on several criminals. The number of crimes committed in cyberspace is growing in proportion to the number of users of computer networks, and, according to Interpol, the rate of crime growth, for example, in the global Internet, is the fastest on the planet.

Today's world is more interconnected than ever before. «Private life is not normal nowadays» once said Mark Elliot Zuckerberg – American programmer, one of the founders of Facebook. Indeed, it is enough to look at the page of almost any user of any social network to find out where they were, what they ate and with whom they met. That is the reason why many people are concerned that so

much of their personal information is freely available. Consequently, expanding connection to the Internet brings an increased risk of theft, fraud, and abuse. As people become more reliant on modern technology, we also become more vulnerable to cyber-attacks such as corporate security breaches, spear phishing, and social media fraud [1]. That is the reason why cybersecurity is an essential field right now to develop.

Since cybercrime covers the widest layer of public relations, involves the use of various equipment and has a whole range of ways to commit, it is logical to classify it. The first group includes all computer crimes against computer data and systems (for example, illegal access, and interference with data or systems in general). The second group consists of illegal acts related to the use of technology (forgery, extraction, blocking or alteration of data, obtaining economic benefits by other means). Offences of the third group are related to crimes aimed at data content. Infringement of copyright and related rights belongs to the fourth group, the allocation of certain types of crimes in which is attributed to the legislation of specific states. Cyberterrorism and the use of virtual space to commit acts of violence, as well as other acts that infringe on public security, are included in the fifth group of cybercrimes [2].

Cybersecurity refers to the list of particular processes and practices designed to defend people's accounts, gadgets from cyber-attacks, stealing information and damage. Cybersecurity may, in addition, be referred to as information technology security. This is crucial for society as lots of government departments and organizations receive, and process enormous amounts of data that cannot be always safe, and losing it might lead to terrifying consequences. In the modern stage of the development of IT, security functions are a big part of collecting and handling information. Data is not introduced in its clear form, there is a barrier preventing any possible threat. The most popular measures, used to protect against cyber threats in the world, are antivirus, client firewalls, installation of updates, including those that eliminate vulnerabilities in software, and data backup, yet there are not enough studies made to prove that these measures work properly.

Scientists have made research on the number of cyber-attacks. In 2020, the medium cost of an info violation was USD 3.86 million globally, and USD 8.64 million in the United States [3]. This outlay combines the expenses of discovering and responding to the breach, the price of downtime and lost income, and the long-run reputational damage to a business and its brand. Cybercriminals target customers' personally identifiable information – names, addresses, federal identification numbers, and credit card information – and then sell these records in underground digital marketplaces. Compromised PII often leads to a loss of client trust, regulatory fines, and even legal action. Hacking targets can be extremely diverse. Firstly, in this path, criminals can discover official secrets or steal certificates for business services. The carelessness of users makes it easier for them. Secondly, attackers can obtain confidential photos for blackmail or their entertainment. To reduce the likelihood of hackers interfering with the computer and its dependent devices, IT specialists must trace parameters of data holders and information hijacking.

Security system complexity, created by disparate technologies and an absence of in-house expertise, can exaggerate these costs. Nevertheless, organizations with an adequate cybersecurity strategy, governed by beyond compare practices and machine-controlled using advanced analytics, artificial intelligence (AI) and tool learning, can confront cyber threats extra effectively and shorten the lifecycle and effect of breaches when they emerge. To protect against accidental threats, means of increasing the reliability of automated systems, means of increasing the reliability and redundancy of information are used.

Ensuring cybersecurity requires coordination of safekeeping efforts undertaken through the data system, including application security, information security, web security, disaster recovery/business continuity planning, functioning security, end-user training. In cybersecurity, it can be a challenge to maintain dynamic security risks. The standard approach was to focus resources on the virtually significant components of the system, which meant that the other components remained exposed and did not safeguard the systems from fewer dangerous risks. To cope with the current conditions, consultative organizations are promoting a more proactive and accommodative approach. The National Institute of Standards and Technology (NIST), for example, has issued updated

guidelines in its risk assessment framework that recommend a transition to continuous monitoring and evaluation in real-time.

When ensuring the security of an information system, it is necessary to take into account all the weak, most vulnerable points of the information processing system, as well as the nature, possible objects and directions of attacks on the system by violators (especially highly skilled intruders), ways of penetration into distributed systems and ways of unauthorized access to information. To block the channels of unauthorized access to information, it is of great importance to build identification and authentication systems that allow you to restrict access to protected information. Such systems are used both for physical access control (biometric authentication, authentication using a specific object) and for access control to resources and data (password systems) [1]. The protection system should be built not only taking into account all known penetration channels but also taking into account the possibility of fundamentally new ways of implementing security threats. To build a concept that satisfies the entire set of requirements, the theory of information protection has been actively developed recently, including the concepts of protection tasks, means of protection, and protection systems. For example, for these reasons, AI was invented. AI is changing the game for cybersecurity, analysing massive quantities of risk data to speed response times and augment under-resourced security operations. Nevertheless, there is always another side to the coin.

Cybersecurity is constantly being questioned by hackers, data loss, privacy, risk management and changing strategies. Currently, there is nothing existing to indicate a decrease in the number of cyber-attacks. Moreover, the more entry points for attacks, the more forces are required to protect networks and devices. One of the most problematic elements of cybersecurity is the ever-changing nature of security risks. As new technologies appear and are used in a new way or differently, new ways of attacks appear. It can be difficult for organizations to keep up with these constant changes and progress in attacks, as well as to update their methods of protection. This also includes ensuring that all elements of cybersecurity are constantly being changed and updated to protect against potential vulnerabilities, which can be especially difficult for small organizations. In addition, today, there is a lot of potential data that an organization can collect about individuals participating in one of their services. As more data is collected, the likelihood of a cybercriminal who wants to steal personal information is another concern. For example, an organization that stores personally identifiable information in the cloud may be attacked by a ransomware programme, and it should do everything possible to prevent penetration into the cloud [4]. Cybersecurity should also be related to end-user training. The security policy should be based on the triad of security (confidentiality, integrity and accessibility). Users must protect and guarantee the application of the triad of security in data and systems, which does not depend on how the data was created, transferred to others or stored [2]. Users should be aware of their responsibilities and the consequences of violating the security policy. Another serious cybersecurity problem is the lack of jobs. As the growth of data volumes from enterprises becomes more and more important, there is an increasing need for more cybersecurity specialists to analyse, manage and respond to incidents. However, new advances in machine learning and artificial intelligence (AI) have begun to be developed to help organize and manage data, although not to the desired effect.

The issues of ensuring timely and unhindered access to information are becoming increasingly important with the development of distributed processing systems. The complexity of the topology of the systems, the equipment used and the software used, as well as the task of interfacing all elements, require increased attention to ensuring the operability of the system and the availability of information circulating in it. A separate area of protection is ensuring the secrecy of the parameters of the information system in which confidential information circulates. The methods of protecting the parameters of such a system are similar to the general methods used to protect the confidentiality of information.

To date, numerous different security models have been developed, all of them express several initial security policies. At the same time, the criterion of security of subjects' access to objects is important, i.e. the rule of dividing information flows generated by subjects' access to objects into safe

and unsafe ones. The system is safe if and only if the subjects cannot violate the security policy established in the system [2].

It is almost impossible to control cybercrime and fight it at the level of an individual state. The adoption of international norms and standards should be accompanied by changes in the national legislation of states. Coordination of efforts by states is necessary to ensure rapid response to the development of computer technology and the adoption of relevant standards. Currently, more than forty countries of the world are involved in the formation of an international strategy to combat cybercrime, and this process promises to be quite long. However, despite all the difficulties, it is obvious that the international community needs to come to a solution to the problems of unifying legislation. Otherwise, given the transboundary nature of cybercrime, certain inconsistencies in legislation and lack of coordination of criminal policy will allow those who have committed socially dangerous acts to avoid responsibility and make it difficult to investigate crimes and prosecute offenders. Thus, information security standards face a difficult task to create an effective mechanism for interaction between all parties.

In order to meet the requirements of confidentiality, integrity and operability, it is necessary to implement an appropriate set of security functions, such as identification and authentication, access control, recovery after failures, etc. For security tools to be recognized as effective, a certain degree of confidence in the correctness of their choice and reliability of functioning is required [2]. A new level of standardization will create a single safe space in which the certification of the security of information processing systems will be carried out on a global level that will provide opportunities for the integration of national information systems. Therefore, the main task of information security standards is to coordinate the positions and goals of manufacturers, consumers and classifier analysts in the process of creating and operating information technology products.

One of the greatest strengths of our modern, developed society is also one of its main drawbacks. In today's interconnected world, developed and high-tech societies are highly dependent on the work of several services and services that have now become vital. A certain infrastructure ensures the normal operation of basic services and production systems in any society. Therefore, failure of their work due to natural causes, technical problems or deliberate actions can have serious consequences for the supply of resources or the work of critical services, not to mention a security threat. In recent years, cybercrime has been steadily increasing worldwide. This again proves the importance of decent cybersecurity, especially when it is well held within all the countries around the world, as data security is more about teamwork rather than creating individual protocols.

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**ЗАДАЧА О НАТЕКАНИИ СТРУИ КОНЕЧНОЙ ТОЛЩИНЫ  
НА БЕСКОНЕЧНУЮ СТЕНКУ  
THE PROBLEM OF JET IMPINGEMENT OF A FINITE THICKNESS  
ON AN ENDLESS WALL**

**Аннотация.** В статье рассматривается решение задачи о натекании струи конечной толщины на бесконечную стенку методом особых точек. Решение задач о течениях со свободной границей наиболее успешно изучалось в теории плоскопараллельных струйных течений идеальной несжимаемой жидкости с использованием методов теории функции комплексной переменной. Впервые данный метод был применён в работах Геймгольца и Кирхгофа. Поверхностями раздела являются поверхности струй, давление вдоль которых принимается постоянным. Далее рассмотрено установившееся потенциальное движение несжимаемой жидкости. Свободная поверхность значительно осложняет решение краевой задачи с заранее неизвестной границей, форму которой определяем в процессе решения. В результате исследования получено выражение для струи в параметрическом виде. В качестве примера построены свободные поверхности для углов натекания  $\alpha=\pi/4$  и  $\alpha=\pi/2$ .

**Abstract.** The article considers the solution to the problem of jet impingement of a finite thickness onto an endless wall using singularity method. The solution of problems regarding flows with a free boundary has been most successfully studied in the theory of plane-parallel jet flows of an ideal incompressible fluid using the methods of the theory of functions of a complex variable. This method was applied originally in the works of Helmholtz and Kirchhoff. The interface surfaces are the surfaces of jets with assumed constant pressure. Then the steady potential motion of incompressible fluid is being considered. A free surface complicates significantly the solution of boundary value problem with a previously unknown boundary, the shape of which is determined during the process. The result obtained is the expression for the jet in a parametric form. As an example, free surfaces are constructed for the angles  $\alpha = \pi / 4$  and  $\alpha = \pi / 2$ .



**Ключевые слова:** метод особых точек, теория струй, струя конечной толщины.

**Key words:** singularity method, jet theory, jet impingement of a finite thickness.

The difficulty in studying the jet theory problems arises from the presence of a free surface, since it is necessary to solve boundary value problems in domain with an unknown boundary, the shape of which is determined in the process of solving problems.

It was Helmholtz and Kirchhoff who first considered the problem of plane-parallel potential motions of an incompressible fluid in 1867 and 1868. They considered the problems of fluid outflow from a vessel with flat walls and flow around a flat plate with jet disruption. In the process of solving these problems, Helmholtz and Kirchhoff first applied methods of the theory of functions of a complex variable in hydromechanics [3, p. 200].

A plane flow is considered, the diagram of which is shown in the figure (Figure 1). A jet of finite thickness  $h$  falls at an angle  $\alpha$  on the wall and spreads over it. At free boundaries AB and AC, the pressure  $p_0$  and the speed  $v_0$  are constant.

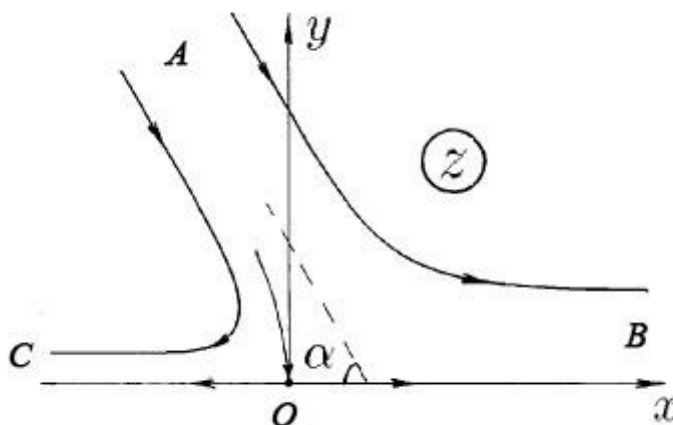


**Figure 1.** Planar flow diagram

The field of variation of the complex potential  $w$  is a strip of finite width equal to the value of the flow rate  $q$  between the streamlines AB and AC. The complex potential is determined up to an arbitrary additive constant, which allows the origin of coordinates in the plane  $w$  to be chosen in an arbitrary way (Figure 2).

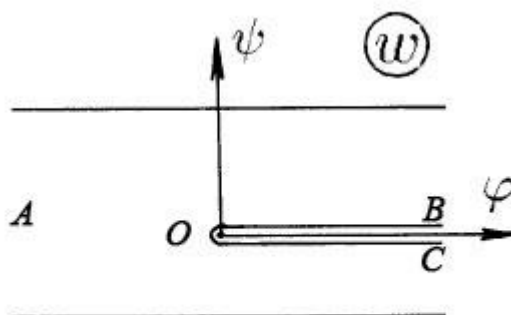


**Figure 2.** The plane of the complex potential  $w$

Let's figure out the area of change  $\frac{dw}{v_0 dz}$ . Suppose that at point B the angle between the velocity vector  $v_0$  and the OX axis is zero -  $\vartheta_B = 0$ , then  $\vartheta_A = -\alpha$  and  $\vartheta_C = -\pi$ . Determine the position of points on the plane  $\frac{dw}{v_0 dz}$  [2, p. 33]:

$$\begin{aligned}\frac{dw}{v_0 dz}(A) &= \frac{v_0}{v_0} e^{-i(-\alpha)} = e^{i\alpha} \\ \frac{dw}{v_0 dz}(B) &= \frac{v_0}{v_0} e^{-i(0)} = 1 \\ \frac{dw}{v_0 dz}(C) &= \frac{v_0}{v_0} e^{-i(-\pi)} = e^{i\pi} = -1\end{aligned}$$

The modulus of the complex velocity  $\frac{dw}{dz}$ , that is equal to the modulus of the fluid velocity, is constant on the free surfaces AB and AC, and the free surfaces AB and AC are circular arcs of unit radius in the  $\frac{dw}{v_0 dz}$  plane.

The range of variation  $\frac{dw}{v_0 dz}$  is the interior of the upper semicircle of the unit radius (Figure 3).

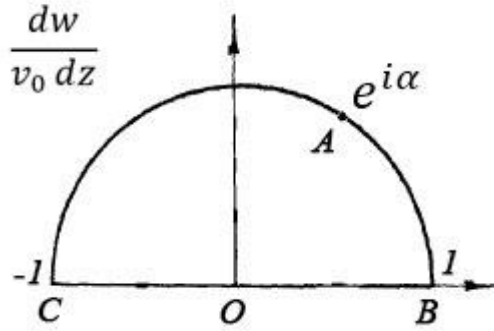


**Figure 3.** The  $\frac{dw}{v_0 dz}$  plane

To solve the problem, we will use the method of singular points [1, p. 42]. As an auxiliary parametric domain  $u$ , we choose the upper right quadrant (Figure 4). On the boundary of the region  $u$ , one can, but taking into account the principle of matching the boundaries, choose arbitrarily the position of three points. Let point C be placed at the origin, point B at infinity, and point O at  $u = 1$ . In this case, point A corresponds to some point  $u = ia$  of the imaginary axis.

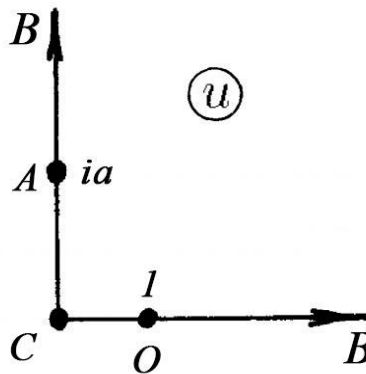


**Figure 4.** The plane of the parametric variable  $u$

To construct the mapping  $\frac{dw}{v_0 dz}(u)$ , firstly, it is necessary to analyze the zeros and singularities that this function has at the characteristic points of the  $u$  plane [1, p. 43]. At the point  $O$  the function  $\frac{dw}{v_0 dz}(u)$  has zero of the first order, at the points  $A$ ,  $B$  and  $C$  the function  $\frac{dw}{v_0 dz}(u)$  has no zeros and singularities. In the analytic continuation of this function to the entire complex plane  $u$ , a pole of the first order should be placed at the point  $u = -1$ . Then the function  $\frac{dw}{v_0 dz}(u)$  extended to the whole plane  $u$  will have the form:

$$\frac{dw}{v_0 dz}(u) = M \frac{u-1}{u+1} \quad (1).$$

Let's consider the function  $w(u)$ . When traversing the point  $u = 1$  along the infinitesimal semicircle counterclockwise,  $\arg(u-1)$  increases by  $\pi$ , and  $\arg(w)$  increases by  $2\pi$ . Hence, at the point  $u = 1$  the function  $w(u)$  has a zero of the second order, and the function  $\frac{dw}{du}(u)$  has a zero of the first order. At points  $A$ ,  $B$ , and  $C$ , the function  $w(u)$  has logarithmic singularities, and a  $\frac{dw}{du}(u)$  has first-order poles. In the analytic continuation of the function  $\frac{dw}{du}(u)$  to the entire plane  $u$ , a first-order zero should be placed at the point  $u = -1$ , and a first-order pole at the point  $u = -ia$  [1, p. 45, 2, p. 92]. Then the function  $\frac{dw}{du}(u)$  extended to the whole plane  $u$  will have the form:

$$\frac{dw}{du}(u) = N \frac{(u-1)(u+1)}{u(u-ia)(u+ia)} \quad (2).$$

It is necessary to determine the unknown quantities  $M$ ,  $N$  and  $a$ . [2, p. 33].

$$\begin{aligned} \frac{dw}{v_0 dz}(B) &= M = \frac{v_0}{v_0} e^{i0} \\ \frac{dw}{v_0 dz}(A) &= \frac{ia-1}{ia+1} = e^{i\alpha} \\ -\frac{(1-ia)(1+ia)}{1+a^2} &= e^{i\alpha} = \cos\alpha + i\sin\alpha \\ a^2 &= \frac{1+\cos\alpha}{1-\cos\alpha} = \cot^2\left(\frac{\alpha}{2}\right) \\ a &= \cot\left(\frac{\alpha}{2}\right) \end{aligned}$$

The constant  $N$  can be expressed in terms of the flow rate  $q$  in the jet  $A$ . Expansion (2) in the vicinity of  $u = ia$  has the form [2, p. 80]:

$$\begin{aligned} \frac{dw}{du}(ia) &= N \frac{(ia)^2 - 1}{(ia)(2ia)} \frac{1}{u-ia} + \dots \\ N \frac{-a^2 - 1}{-2a^2} \frac{1}{u-ia} + \dots &= N \frac{a^2 + 1}{2a^2} \frac{1}{u-ia} + \dots \end{aligned}$$

Integration of this expression over an infinitely small semicircle around  $u = ia$  gives [2, p. 45]:

$$iq = N \frac{a^2 + 1}{2a^2} i\pi$$

Indeed, the integral of  $\frac{dw}{du}(u)$  determines the change in the function  $w(u)$  when passing through  $u = ia$ , that is equal to the jump  $\text{Im}(w(u))$  by the value of the liquid flow rate in the jet. On the other hand, when integrating the expression  $\frac{1}{u-ia}$  over this arc, we obtain  $\pi i$ , and the integral over the infinitesimal contour of the holomorphic part of the expansion is equal to zero [2, p. 45], then:

$$N = \frac{2\pi a^2}{a^2 + 1}$$

We obtain an expression for  $\frac{dz}{du}(u)$ :

$$\frac{dz}{du}(u) = \frac{\frac{dw}{du}(u)}{\frac{dw}{dz}(u)} = \frac{2\pi Ctg^2(\frac{\alpha}{2})}{1 + Ctg^2(\frac{\alpha}{2})} \frac{(u+1)^2}{(u-1)(u^2 + Ctg^2(\frac{\alpha}{2}))}$$

After integration, we get:

$$z(u) = \frac{2\pi Ctg^2(\frac{\alpha}{2})}{1 + Ctg^2(\frac{\alpha}{2})} * \left\{ \frac{Ctg^2(\frac{\alpha}{2}) - 3}{2(Ctg^2(\frac{\alpha}{2}) + 1)} \ln(u^2 + Ctg^2(\frac{\alpha}{2})) \right. \\ \left. + \frac{3Ctg^2(\frac{\alpha}{2}) - 1}{Ctg(\frac{\alpha}{2})(Ctg^2(\frac{\alpha}{2}) + 1)} \operatorname{arctg}\left(\frac{u}{a}\right) + \frac{4}{Ctg^2(\frac{\alpha}{2}) + 1} \ln(|u-1|) \right\}$$

Thus, the expression for  $z(u)$  is obtained in a parametric form. Knowing  $z(u)$ , it is possible to construct the shapes of free surfaces for different incidence angles  $\alpha$ , and also to calculate the main characteristics of the flow. As an example, free surfaces for corners are constructed  $\alpha = \frac{\pi}{4}$  (Figure 5) and  $\alpha = \frac{\pi}{2}$  (Figure 6).

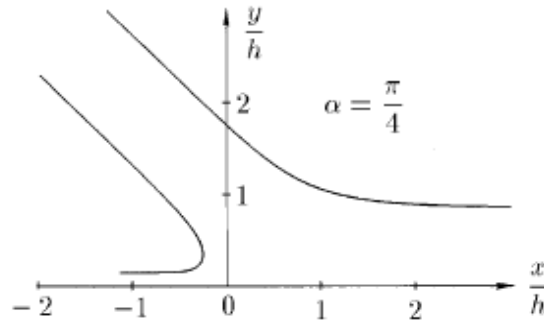


**Figure 5.** The shape of the free surface of the jet at the angle of incidence  $\alpha = \frac{\pi}{4}$

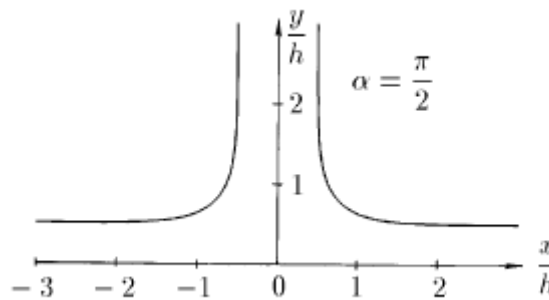


**Figure 6.** The shape of the free surface of the jet at the angle of incidence  $\alpha = \frac{\pi}{2}$

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## **ДРОНЫ В МОРСКОЙ ИНДУСТРИИ DRONES IN THE MARINE INDUSTRY**

**Аннотация.** Развитие информационных технологий с каждым годом затрагивает все больше отраслей и сфер жизнедеятельности человека. Морская отрасль не стала исключением. Среди многочисленных направлений развития автор выделяет интенсивное внедрение беспилотного летательного аппарата (БЛА) в морскую индустрию. Внимание разработчиков направлено на реализацию проектов БЛА, которые, по мнению экспертов в морской области, являются многообещающим и новаторским ответвлением развития. Автор представляет преимущества в виду удобства и безопасности, а также и недостатки данной системы, такие как недопустимость должного управления и контроля устройствами и их системами в сложных климатических условиях. Автор представляет обзор основных проектов по внедрению дронов в мире, а также в Российской Федерации. Несмотря на данные недостатки, БЛА активно развиваются и прогрессируют, привлекая к себе все больше внимания для освоения и получения наивысшей эффективности после ее внедрения в морскую индустрию.

**Abstract.** The development of information technologies every year affects industries and a lot of spheres of human life. The maritime industry is not an exception. Among some areas of development, the author highlights intensive introduction of unmanned aircraft (UA) in marine industry. There are designers aimed at the development UA projects, which, according with experts in marine industries are promising and innovating vector of development. There are the advantages in terms of convenience and safety, as well as the disadvantages of this system, such us inability of proper management and control of devices and their systems in poor weather conditions. The author presents an overview of the main projects for the introduction of drones (unmanned aircraft) in the world, and in the Russian Federation. Despite these disadvantages, UA is actively developed and

progressed, attracting a lot of attention to the development and gets the highest performance after its introduction into the marine industry.

**Ключевые слова:** дрон, беспилотный летательный аппарат, развитие технологий, морская индустрия.

**Key words:** drone, unmanned aircraft, technology development, marine industry.

Humanity does not stay still, and together with it, technologies are developing, which are being improved and progressed every year. They began to play a big role in our lives, without which it is now impossible to imagine our life.

As the development of drone technology gathers pace for both military and recreational purposes, unmanned aerial vehicles are also getting more prevalent in the maritime industry. Drones are getting more and more attention, proven to be a fruitful tool in the shipping and offshore industries, changing the way organizations operate across the world. For the time being, some ports already use drones and have adapted to the new era, but on the other hand, some are still on the trial phase, trying to grasp the pros and cons of using drones in everyday operations [2; 6].

We can define the following advantages of using drones in shipping:

1. Accuracy. As unmanned aerial vehicles use GPS (Global Positioning System), they can be programmed and precisely maneuver in specific locations. This is especially useful in different situations.

2. Mobility. With the development of controlling technologies, most drones can be deployed and used with relatively minimal experience. UAs also have a longer range of movement. They can fly lower and in different directions which allows them to easily navigate traditionally inaccessible places.

3. Safety. With the appropriate license, operators can use unmanned aerial vehicles for security and surveillance.

4. Unpretentiousness in work. The possibility of application in difficult weather conditions and in conditions of accident risk for the device [1].

Also, there are several minuses as follows:

1. Legislative uncertainty. It includes the question how to determine property rights in the airspace and protect against illegal entry from the air.

2. Safety. Drones should be able to detect a potential collision and maneuver to a safe place.

3. Privacy. Drones can collect data and images without attracting attention, which makes many people fear that their right to privacy may be at risk.

It's easy to get excited about the potential of the technology, but many of these forecasts are based on how the drones might be used, as opposed to the difference they're actually making. That is why determining the right investment in unmanned aerial vehicles is the main factor and it is why the current applications of drones in maritime and offshore services are so important to consider.

The use cases of today are what will make some of those billion-dollar predictions possible, and makes it essential to see these uses are explored in depth and in detail at industry events [6].

Some inland vessels enter the port only for a little time. The crew may not always have time to put the car ashore to collect certain items. In this case, the crew uses the delivery of necessary parcels and cargo using drones. In this case, for example, ordering parts online and delivering them by drones can save much time. Efficiency is one of the notable advantages of using such drones. The unmanned aerial vehicles used for this test cover almost a mile and make the entire trip in about 10-15 minutes. The maximum weight of packages is about 3 pounds. The drones could handle slightly longer routes and heavier loads. Thus, these vehicles could provide shipping companies with another option when transporting cargo to sea vessels [4].

Every year people die inspecting enclosed spaces. These spaces can have reduced oxygen levels, toxic gases, and material which can be unsafe for humans. Dangerous gases are a notable cause

of fatalities at sea, where enclosed cargo holds many contain noxious gases. Using drones for this work can enhance safety and reduce costs. Drone-based solutions for the inspection of enclosed spaces consist of sending drones into void spaces, duct keels, ballast and potable water tanks, or cargo and storage tanks, for mapping, surveying, sniffing, and measuring the thickness of paint.

For land-based inspections, drones working during a day can do what three workers need three days to finish, without requiring any suspension of operations. Also, drones can survey spaces that people can't access, and drones are much faster to receive and transmit data. A real break changer may come when drones can perform tasks autonomously, where trained pilots are not needed. For maritime and offshore applications, drone developers are targeting oil and gas companies for infrastructure inspection and monitoring, while application for enclosed spaces is incoming.

In addition, drones are now being used extensively for tasks such as security and surveillance, and remote inspections. In the same way that drones can simply be thought of as sensors in the sky, it's can also be considered cameras able to take pictures and videos from a different of angles, and aren't limited to a one location. A single drone could be used to collect more and better info than a series of cameras that are placed through a given location. When combined with info from stationary cameras, organizations can use drones to enable complete awareness.

The European Maritime Safety Agency (EMSA) is using drones to help with border control, pollution monitoring and the detection of illegal activities such as fishing and drug trafficking. Border patrol agents in Arizona have been testing new and smaller types of drones to support their land and maritime operations. These devices can also use sensors and infrared cameras which have facial-recognition capabilities to further enhance their efforts.

Efficiency and speed are important reasons in this context. If the drone can get to hard-to-reach parts and identify the problem, it can be fixed much faster. That there is unclaimed potential for small unmanned aerial vehicles and that not only large unmanned vessels are part of the autonomous future of the industry. That in the future, unmanned aerial vehicles can be used to check small boats in "so-called hot spots" to support search and rescue operations.

It has been proven that unmanned aerial vehicles significantly increase the efficiency of almost any search and rescue operations, and this difference is especially clear at sea.

A drone equipped with ViDAR could to autonomously detect a lot of large and small objects at sea in a variety of conditions. ViDAR (Visual Detection and Ranging), the world's first optical radar, is a wide-range marine visual search-engine that has been proven to work up to sea level 6 [5]. ViDAR autonomously finds objects on the ocean surface over substantially larger areas than traditional search methods. Vidar works optically, so it is not affected by white caps and other effects affecting technologies such as radar. All the day ViDAR is able to detect objects that are very small - far beyond the abilities of the human eye - in order to considerably expand the range of the aircraft in a wide range of search and rescue missions, including search and rescue, illegal fishing, drug control and maritime safety.

ViDAR is used by the Australian Maritime Safety Authority, the Royal Australian Navy, the US Coast Guard, the Canadian Department of Fisheries and Oceans, the Mexican Navy and many other agencies and forces.

The advantages that unmanned aerial vehicles create for search and rescue operations are unbelievably great, but this effectivity will be taken to a completely new level when the autonomous capabilities of unmanned aerial vehicles are further determined.

These drones are designed for observation and exploration, but their main purpose is to stop organized crime and repress illegal drug trade

One of the main supremacies of such UAVs is that they are equipped with infrared camera, electro-optical camera with individual software for visual identification, range determination with high accuracy. Also, UAS (unmanned aircraft system) can be used to identify oil pollution. Super priority, is consist of, that it can supervise an area considerably ahead of radar and observe objects or any danger better.

There are still many minor limitations that the police have to overcome in order to force drones to fight crimes together. However, the effectiveness and efficiency of unmanned technologies are

undeniable. Drones can save time, costs and, most importantly, lives. It's just a matter of time before unmanned aerial vehicles will be used all over the world, making it a safer place to live.

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## **АНАЛИЗ РАБОТЫ ОДНОКАНАЛЬНОГО ЦИФРОВОГО USB-ОСЦИЛЛОГРАФА С КОММУТАТОРОМ П323 ANALYSIS OF OPERATION OF A SINGLE-CHANNEL DIGITAL USB-OSCILLOSCOPE WITH A P323 SWITCH**

**Аннотация.** В этой статье рассматриваются способы получения двух сигналов на одноканальных лучевых осциллографах и производится попытка применения этих же методов к одноканальному USB-осциллографу. Для реализации выбранного метода был использован коммутатор, что позволило значительно расширить функциональные возможности исследуемого прибора. Помимо этого, было разработано дополнительно устройство, предназначенное для синхронизации изображения, выводимого осциллографом, с одним из сигналов. В результате была получена возможность наблюдать изображение двух рассматриваемых сигналов на экране одноканального USB-осциллографа. Кроме того, были проведены испытания собранной схемы внешней синхронизации и найдены пределы её нормального функционирования.

**Abstract.** This article considers how acquiring of two signals on a single-beam oscilloscope and an attempt to apply those methods to a single-channel USB oscilloscope. To implement the chosen method a switch was used that can expand the capabilities of the device under study. In addition, another device was developed, which is designed to synchronize the image displayed by the oscilloscope with one of the signals. As a result, it became possible to observe the image of the two signals under study on a single-channel USB oscilloscope. Moreover, the external synchronization circuit was tested and the limits of its normal operation were found.

**Ключевые слова:** USB-осциллограф PV6501, коммутатор П323, внешняя синхронизация, сравнение сигналов, разработка улучшения осциллографа.

**Key words:** PV6501 USB-oscilloscope, P323 switch, external synchronization, signal comparison, oscillograph upgrade development.

Nowadays, most of research and laboratory works are carried out using an oscilloscope. These devices are useful not only for analyzing electrical circuits, but also for other mechanisms. Analyzing of non-electrical signals is achieved by converting the signal of required physical quantity into an electrical one. A single-channel oscilloscope is enough for analyzing one signal. That's certainly

useful. However, to analyze two (or more) functionally related signals and compare their shapes, amplitudes and phases as well as to determine the relationship between signals is much more needed.

To observe two signals in analog single-beam oscilloscopes, an electronic switching method is used [1, p. 23]. The analysis of signal switching methods for analog oscilloscopes will be reviewed below.

There are two common methods of switching:

1. frame-by-frame displaying the targeted signals on the oscilloscope (personal computer) screen;
2. displaying dot fragments of each plot using an external high frequency generator.

*The first method* assumes alternate switching of the signal arriving at the input of the oscilloscope exactly at the moment when the previous signal has been fully output. Considering the inertia of human vision, comfortable observation of such signals is possible at a frame rate of at least 100 Hz. The disadvantage of this approach is the separation of the signal demonstration during the oscilloscope full sweep. At the same time, information that is not displayed from another channel at this point of time is not controlled and can change significantly, being lost for further research.

*The second method* consists of switching the input signals with a frequency which is much higher than the frequency of the studied signals. In this case, each signal is reproduced by its own piece of the curve within the time specified by an external generator. This type of switching can be seen in Figure 1.

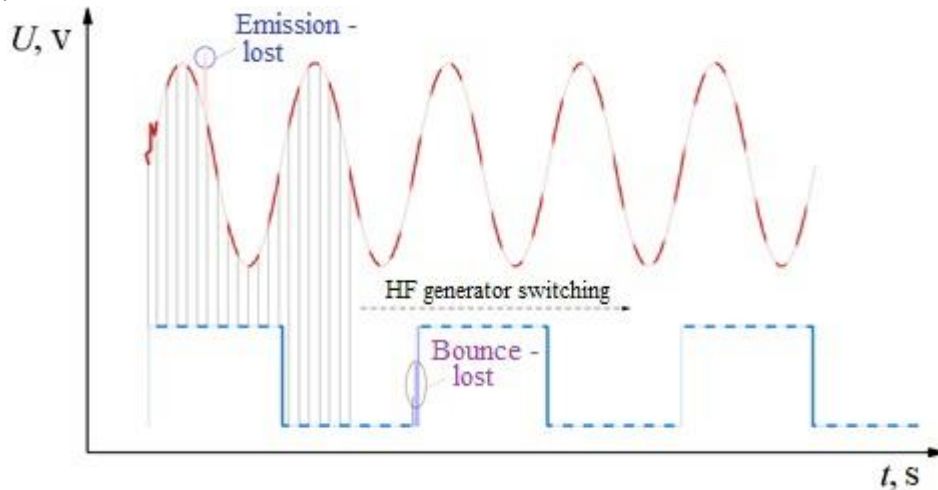


**Figure 1.** The essence of the second signal switching method

This method in contrast to the previous one provides synchronously complete information about the ratios of the parameters of these two signals. As shown in Figure 1, the sampling rate of each chart is reduced by 2 times, so half of the information is lost. To reduce the impact of this factor it is necessary to choose the switching frequency specified by the high frequency (HF) generator.

Since the second switching method allows representing the relationship between two signals better, it will be considered below.

In all analog oscilloscopes switches in order to synchronize them with the input signals, it is required to receive a blanking impulse from the oscilloscope. However, the USB oscilloscope operates differently, so it is impossible to obtain the synchronization signal in a standard way.

To solve this problem, it is possible to use the standard USB-oscilloscope option “External Synchronization”. Particularly, an external synchronization circuit is created in order to generate a synchronizing impulse, the first signal cutting zero in the positive direction.

To determine the moment when the signal cuts zero, a highly sensitive and high-speed device is required. These requirements are well met by a comparator, which makes it easier to implement the task.

To create an external synchronization the circuit shown in Figure 2 has been assembled.

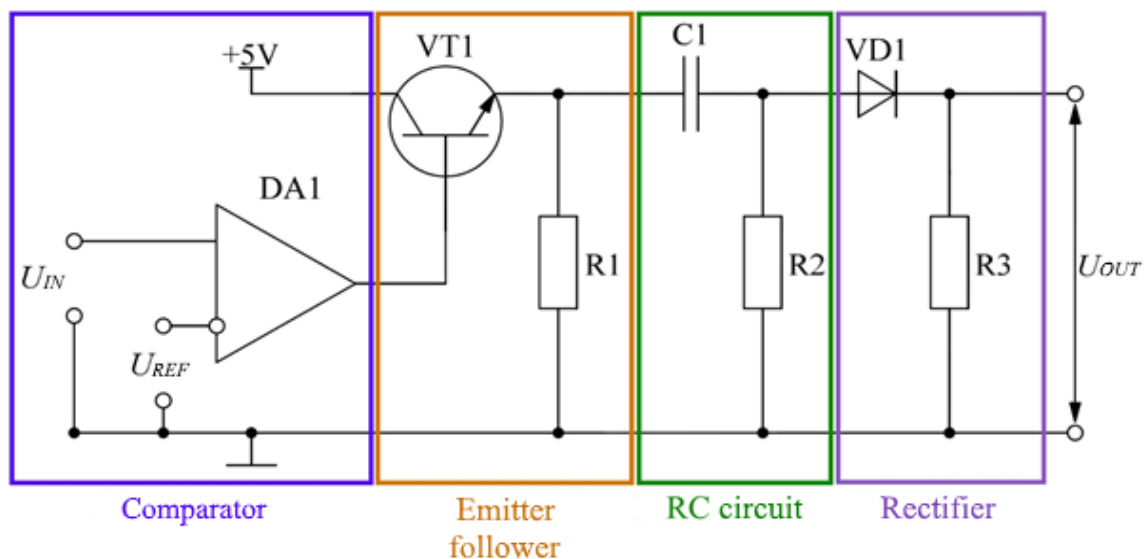


**Figure 2.** External synchronization circuit

The assembled circuit can be divided into 4 main parts:

1. comparator;
2. emitter follower;
3. differentiating resistor–capacitor (RC) circuit;
4. rectifier.

*Comparator* acts as a generator of rectangular pulses  $U_{OUT C}$ . Start of each pulse exactly coincides with the moment when an input signal  $U_{IN}$  exceeds the set value  $U_{REF}$  [3, p. 67].

*Emitter follower* on the transistor VT1 repeats this rectangular signal without distortion and acts as a buffer element between the comparator and the load [3, p. 39].

*Differentiating RC circuit* set on components C1 and R2 forms bipolar sharp-pointed pulses  $U_{OUT RC}$  from rectangular signals [3, p. 16].

*Rectifier* on diode VD1 allows getting unipolar sharp-pointed synchronization pulses of positive (in our case) polarity at the output [3, p. 22].

Graphically, the results of the operation of each part are shown in Figure 3.

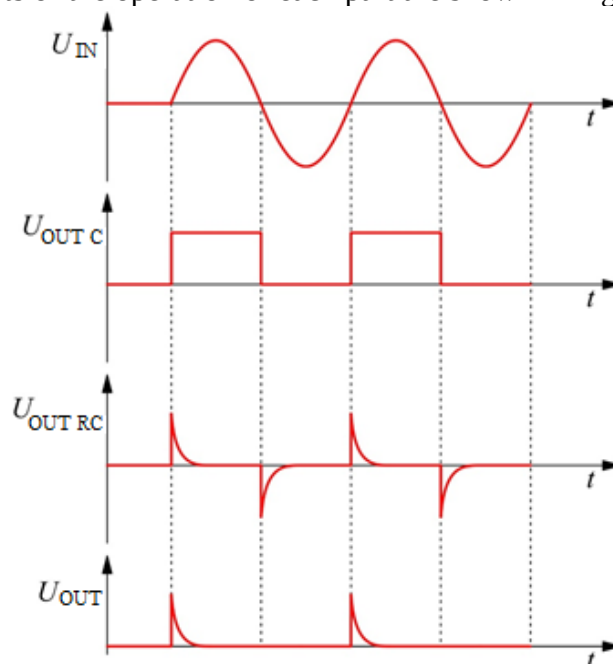


**Figure 3.** Process diagrams in the external synchronization circuit

The oscillograph chart of the circuit in operation is shown in Figure 4.

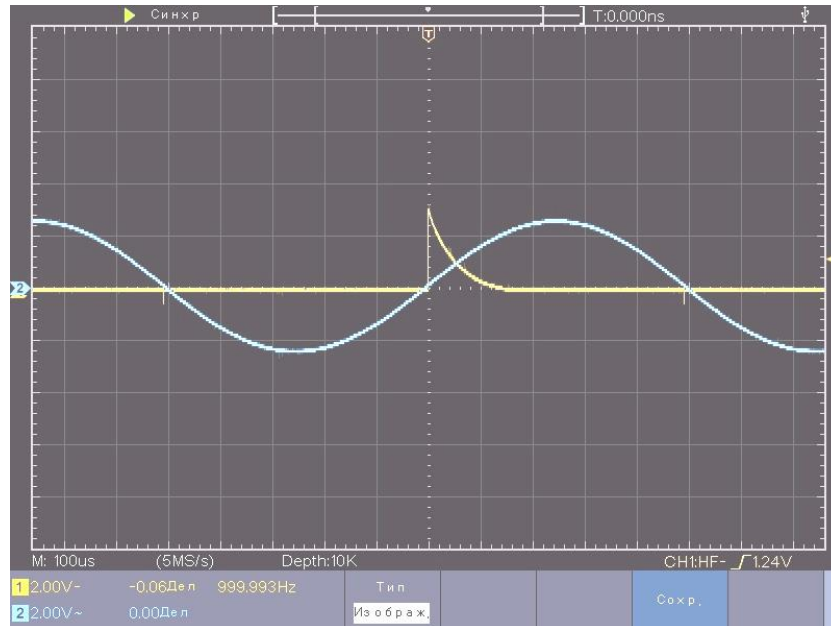


**Figure 4.** Operation of the external synchronization circuit

The blue signal is the input, and the yellow one is the output of the external synchronization circuit. The inverting input of the comparator is grounded ( $U_{REF} = 0$  V), and the sinusoidal voltage with amplitude of 2.5 V and frequency of 1 kHz is applied to the direct input. As seen from the charts, a sharp-pointed synchronization signal with a steep front is formed at the output of the device at the beginning of the positive half-period of the input voltage.

The external synchronization circuit was assembled on a breadboard for further analysis. A detailed wiring diagram with designation of the components used is shown in Figure 5.

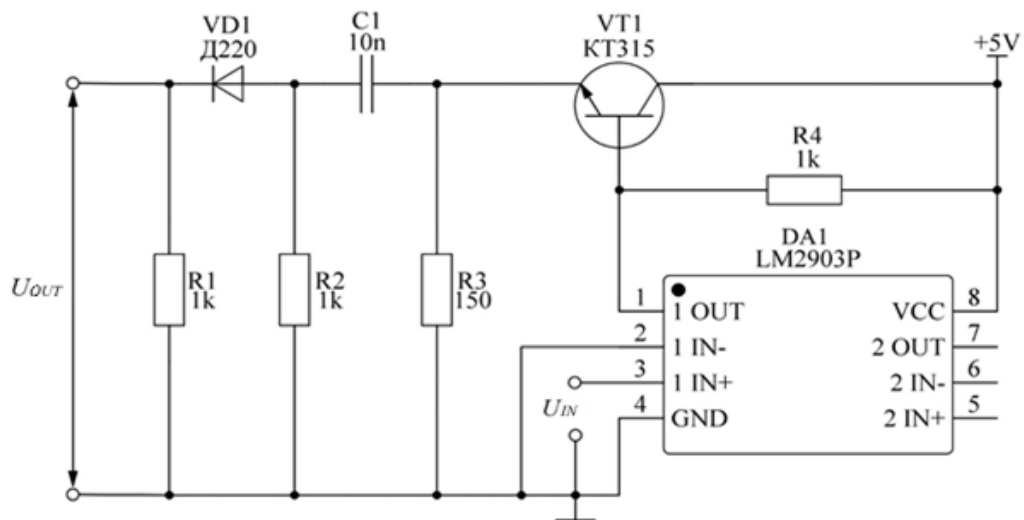


**Figure 5.** External synchronization circuit assembled for further analysis

A number of experiments were carried out to reveal the dependence between the synchronization signal amplitude at the output and the input signal frequency, the results being shown in Table 1 and Figure 6, the plot on Figure 6 is got and shown by MathCAD [2, p. 48].

**Table 1.** Dependence between the amplitude of the sync pulse and the frequency of the input signal

| $f, \text{кГц}$ | $U, \text{В}$ | $f, \text{кГц}$ | $U, \text{В}$ |
|-----------------|---------------|-----------------|---------------|
| 0,005 – 1       | 3,16          | 10              | 1,42          |
| 1               | 3,06          | 12              | 1,34          |
| 2               | 2,68          | 14              | 1,28          |
| 4               | 2,06          | 16              | 1,24          |
| 6               | 1,74          | 18              | 1,16          |
| 8               | 1,56          | 20 – 60         | 1,14          |

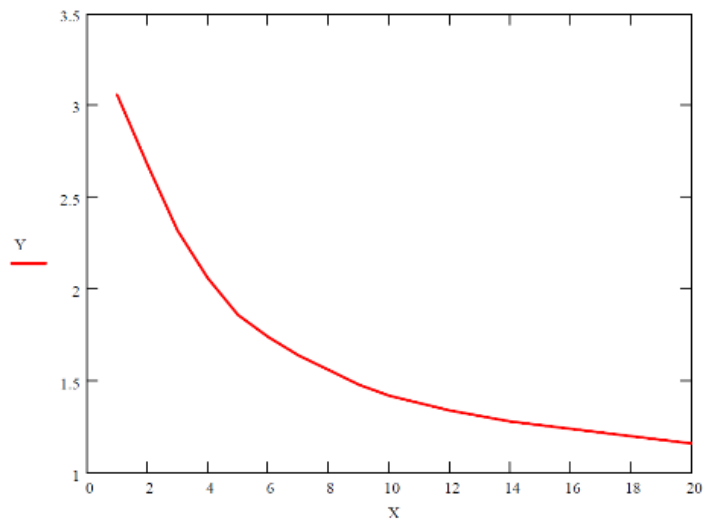


**Figure 6.** Dependency plot of the amplitude of the sync pulse upon the frequency of the signal under study

As a result of processing the experimental data in the Simple Formula approximation program, an empirical formula for the dependence was obtained  $U_{SP} = f(f_{IN})$ :

$$U_{SP} = \left( \frac{539,26 \cdot 10^{-3}}{\exp(f_{IN})} + 248,72 \cdot \ln(f_{IN}) + 128,32 \cdot 10^{-3} \right)^{-1} \quad (1)$$

Experiments were also carried out for higher frequencies, the amplitude of the output signal does not fall below 1.1 V, and after a frequency of 100 kHz it only starts to raise. Since the synchronization of our USB oscilloscope is triggered at a voltage of 1.7 V, this circuit can work reliably up to a frequency of the signal under investigation of 6 kHz. By changing the parameters R and C in the RC circuit, as well as the diode in the rectifier, one can achieve the operation of this circuit in the entire frequency range of the USB oscilloscope.

Using the P323 switch and the assembled external synchronization circuit the results shown in Figures 7 and 8 were obtained.

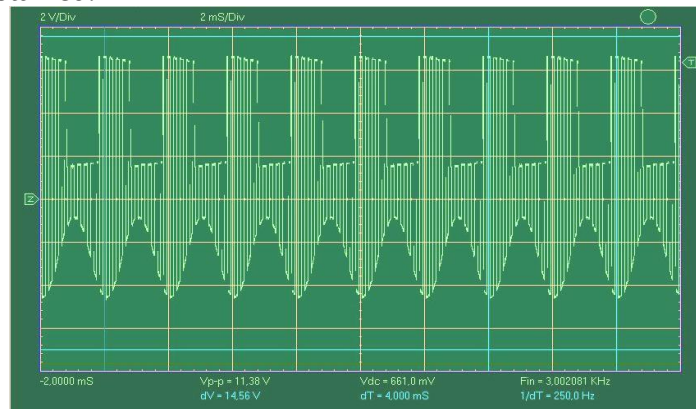


**Figure 7.** Result of sending square and sine waves

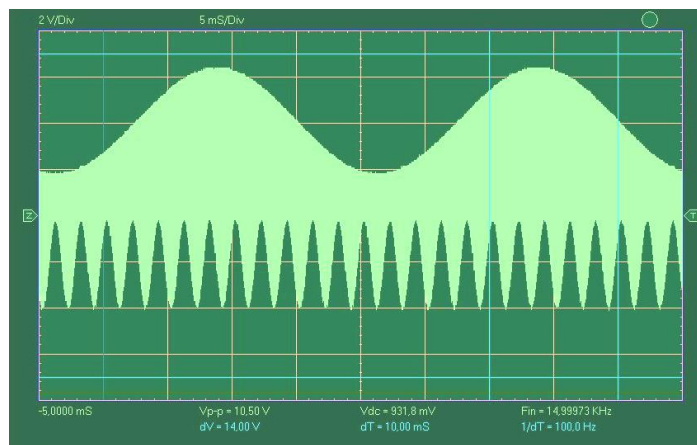


**Figure 8.** Result of sending two sine waves

In Figure low switching frequency 10 kHz is shown. Frequency of both signals is 500 Hz. In Figure 8 high switching frequency 100 kHz is shown. The frequency of the upper sine wave is 40 Hz, the frequency of the lower sine wave is 500 Hz.

Thus, it can be stated that the set goal of obtaining images of the two studied signals on the screen of a single-channel USB oscilloscope has been successfully achieved. It was also stated that increasing the switching frequency of input signals the quality of reproduction of the graphic plot and, accordingly, the accuracy of measurements of signal parameters improve. This observation provides a basis for the development of an adaptive graph sampling system in the future, which tracks changes in the frequencies of the studied signals in a wide range.

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## **ОСНОВНЫЕ ХАРАКТЕРИСТИКИ МАРКОВСКОГО ПРОЦЕССА THE MAIN CHARACTERISTICS OF MARKOV PROCESS**

**Аннотация.** В статье описаны основные характеристики Марковского процесса, который может применяться во время вычислительных экспериментов, в исследованиях, целью которых является прояснение возможной картины будущего развития и прогнозирование значений одних переменных в зависимости от изменений в других. Примеры Марковского процесса описываются с помощью дифференциальных и разностных уравнений. Они составляют один из важнейших классов случайных процессов.

**Abstract.** The article describes the main characteristics of the Markov process. Thus, the Markov process can be applied during computational experiments, in studies whose purpose is to elucidate a possible picture of future development and predict the values of some variables depending on changes in others. The examples of the Markov process are described using differential and difference equations. They form one of the most important classes of random processes.

**Ключевые слова:** Марковский процесс, переход, вероятность, случайное время, дискретное состояние.

**Key words:** Markov process, transition, probability, random time, discrete state.

Markov processes are among the most widely used in engineering, science, and business modelling. They are employed to model systems that have a limited memory of their past. A Markov process can be defined as a system which exists in a series of distinct states, with transitions between them occurring at random intervals. A defining feature of such a process is that the probability of a transition between states is dependent solely on the state that the system is currently in, and not on the history of previous states or time.

The Markov process was first formulated by Alexander A. Markov in 1907. He initiated the study of sequences of dependent tests and related sums of random numbers. This direction of research is known as the theory of Markov chains (a sequence of random events with a finite or countable number of outcomes, where the probability of each event occurring depends only on the state achieved in the previous event.).

However, already in the work of L. Bachelier, one can notice an attempt to interpret Brownian motion as a Markov process, an attempt that was substantiated after Wiener's research in 1923 [4].

The main idea of the Markov process is that "the future is independent of the past given in the present" [3]. In essence, any process can be considered as Markov, if all parameters from the "past", on which the "future" depends, are included in the "present". For example, let's take into account the work of any device: at some point in time it is still operating properly, and we are interested in the probability that it will work for some time in the future. If the current state of the system is considered simply to be "the system is working / on", then the process is certainly not the Markov one, because



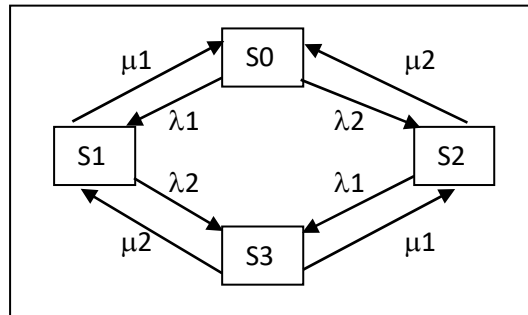
the probability of failing over time generally depends on how long it has already worked and when it was repaired for the last time. If both of these parameters (total working time and time after the last repair) are included in the current state of the system, then the process can be considered as the Markov process. The foundation of the general theory of continuous-time Markov processes was laid by Andrey N. Kolmogorov.

Let's have a look at the example of the Markov process. For example, the technical device  $S$  consists of two units, each failing at a random time. If it happens, the node is being repaired immediately continuing for a previously unknown random time. Possible system states can be listed as follows:

- $S_0$  – both units are operational,
- $S_1$  – the first unit is being repaired, the second one is working properly,
- $S_2$  – the second unit is being repaired, the first one is working properly,
- $S_3$  – both units are being repaired.

Transitions of the system  $S$  from state to state occur almost instantly, at random intervals of failure of one or another unit or completion of repairs.

When analysing random processes with discrete states, it is convenient to use a geometric scheme – the so-called state graph. The states of the system are represented by rectangles (or circles, or even dots), and possible transitions from state to state are represented by arrows connecting the states. We will represent the states by rectangles in which state designations are:  $S_1, S_2, \dots, S_n$  (Pic. 1).



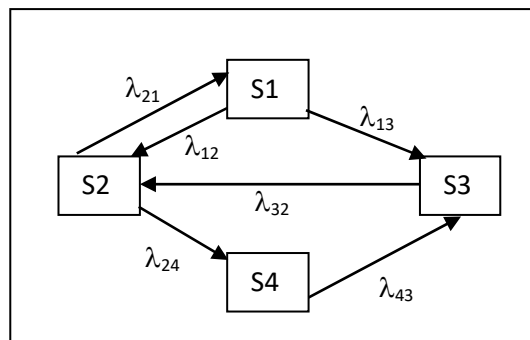
**Picture 1.** The representation of random processes

If the process taking place in a system with discrete states and continuous time is the Markov process, then a fairly simple mathematical model can be constructed to describe it.

Let's consider a system  $S$  with  $n$  possible states  $S_1, S_2, \dots, S_n$ . The probability of the  $i$  state is called the probability  $p_i(t)$  that at the moment  $t$  the system will be in the state  $S_i$ . Obviously, for any moment, the sum of all state probabilities is equal to one.

Having a labeled state graph, one can find all state probabilities  $p_i(t)$  as a function of time. For this, the so-called Kolmogorov equations, a special type of differential equations in which the probabilities of states are unknown functions, are formed and solved.

Let's check out a specific example how these equations are formed (Pic. 2).



**Picture 2.** An example of Kolmogorov equation



Let the system  $S$  have four states:  $S1, S2, S3, S4$ , which are shown in Pic.2. Consider one of the state probabilities, for example  $p1(t)$ . This is the probability that at time  $t$  the system will be in state  $S1$ .

Time  $t$  is given a small increment  $\Delta t$ , consequently let's find  $p1(t + \Delta t)$  – the probability that at time  $t + \Delta t$  the system will be in state  $S1$ . How can this happen? Obviously, there are two possible ways:

1) either at the moment  $t$  the system has already been in the state  $S1$ , and during the time  $\Delta t$  has not left it;

2) either at the moment  $t$  the system has been in the state  $S2$ , and during the time  $\Delta t$  has transitioned from it to  $S1$ .

Let's find the probability of the first option. The probability that at time  $t$  the system has been in state  $S1$  is  $p1(t)$ . This probability should be multiplied by the probability, being at the moment  $t$  in the state  $S1$ , the system in time  $\Delta t$  will transition neither to  $S2$  nor to  $S3$ . The total flow of events that takes the system out of the  $S1$  state will also be the simplest, with the intensity  $\lambda12 + \lambda13$  (when two simplest flows are superimposed – superposition – the simplest flow is again obtained, since the properties of stationarity, ordinariness and absence of consequences are kept). Hence, the probability that the system leaves the state  $S1$  in time  $\Delta t$  is  $(\lambda12 + \lambda13) \Delta t$ ; the probability that it will not work:  $1 - (\lambda12 + \lambda13) \Delta t$ .

Consequently, the probability of the first option is equal to  $p1(t) [1 - (\lambda12 + \lambda13) \Delta t]$ .

Let's find the probability of the second option. It is equal to the probability that at the moment  $t$  the system will be in the state  $S2$ , and in the time  $\Delta t$  it will transition to the state  $S1$ , i.e. it is equal to  $p2(t) \lambda21 \Delta t$ .

Adding the probabilities of both options (based on the addition rule of probabilities), one can get:

$$p1(t + \Delta t) = p1(t) [1 - (\lambda12 + \lambda13) \Delta t] + p2(t) \lambda21 \Delta t$$

After expanding the square brackets, transition  $p1(t)$  to the left side and divide both sides on  $\Delta t$ :

$$(p1(t + \Delta t) - p1(t)) / \Delta t = \lambda21 p2(t) - (\lambda12 + \lambda13) p1(t)$$

Let's direct, as it should be in such cases,  $\Delta t$  to zero; on the left one can obtain the derivative of the function  $p1(t)$ .

The findings suggest the derivation of four differential equations for  $p1(t)$ . Therefore, a system of four linear differential equations with four unknown functions  $p1, p2, p3, p4$  is obtained. It is noteworthy to mention that one of them can be rejected. Using the fact that  $p1 + p2 + p3 + p4 = 1$  one can express any of the probabilities  $pi$  in terms of others; substitute this expression into the corresponding equation, and discard the derivative  $dpi / dt$  [2].

Let's now formulate a general rule for making the Kolmogorov equations. On the left side the derivative of the probability of some ( $i$ -th) state is located. On the right side, the sum of the products of all states probabilities are located, from which the arrows go to a given state, by the intensity of the corresponding events, minus the total intensity of all events that bring the system out of this state, multiplied by the probability of this ( $i$ -th) state.

Surprisingly, one of the first scientific disciplines in which Markov chains have found practical application was linguistics. To illustrate his results, Markov himself investigated the dependence in the alternation of vowels and consonants in the first chapters of “Eugene Onegin” and “Childhood years of Bagrov grandson” [1].

The article has led to conclude that Markov processes provide a natural framework for modelling some behaviour and most studies have followed this paradigm. This process is still used in various disciplines requiring a forecast, the reason for this is an accurate assessment of a random process and the establishment of equilibrium in almost any field of human activity.

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## **МОДЕЛИРОВАНИЕ ОКТОКОПТЕРА В СРЕДЕ SIMULINK MODELING OCTOCOPTER IN SIMULINK ENVIRONMENT**

**Аннотация.** Мультикоптер – летательный аппарат с тремя и более коллекторными или бесколлекторными двигателями, который определяется как вертолётный. В данной статье рассматривается вопрос математического моделирования движения октокоптера, учитывая такие проблемы как специфика эксплуатации и сложная многокомпонентная конструкция. Данный вид конструкции более тяжёлый и менее манёвренный, но обладает большей грузоподъёмностью и большей стабильностью во время зависания на месте. В результате проделанной работы выведена система уравнений, описывающая поведение октокоптера в среде без дополнительных помех, а также моделирование октокоптера в среде SIMULINK.

**Abstract.** A multicopter is an aircraft with three or more brushed or brushless motors. The type of this device is defined as helicopter. This article discusses the issue of mathematical modeling of the octocopter's motion, taking into account the problems such as the specifics of operation and a complex multicomponent structure. This type of structure is heavier and less maneuverable, but has a higher carrying capacity and greater stability while hovering in place. As a result of the work done, a system of equations has been derived that describes the behavior of the octocopter in an environment without additional interference, as well as modeling the octocopter in the SIMULINK environment.

**Ключевые слова:** безвахтенный летательный аппарат, октокоптер, мультикоптер, математическая модель, двигатель, аэродинамика, Simulink.

**Key words:** unmanned aerial vehicles, octocopter, multicopter, mathematical model, engine, aerodynamics, Simulink.

Recently, interest in unmanned aerial vehicles (UAV) of all types has grown dramatically. They are used to simplify the solution of tasks such as aerial photography, cargo delivery. And this is a small part of the possible applications. For example: the tricopter and hexacopter according to the Y3 and Y6 schemes have a specific design, which consists of three arms, at the ends of which rotary servos are located, allowing these types of multicopters to be more maneuverable. [2; 3]. Objects of this type of construction are more difficult to control and less stable than multicopters with a large number of beams. Quadrocopters and hexacopters are less maneuverable, but more resistant to external interference. Octocopters are actively used when shooting major news events, irrigating fields, monitoring disaster zones, floods, and natural disasters.

**Mathematical model of octocopter.** To obtain a mathematical model of movement [1, p. 4-5], the object is considered in a fixed coordinate system  $OXYZ$  and in the moving coordinate system  $OX_1Y_1Z_1$ . These systems pass through the octocopter's center of mass  $C$  (Fig. 1).

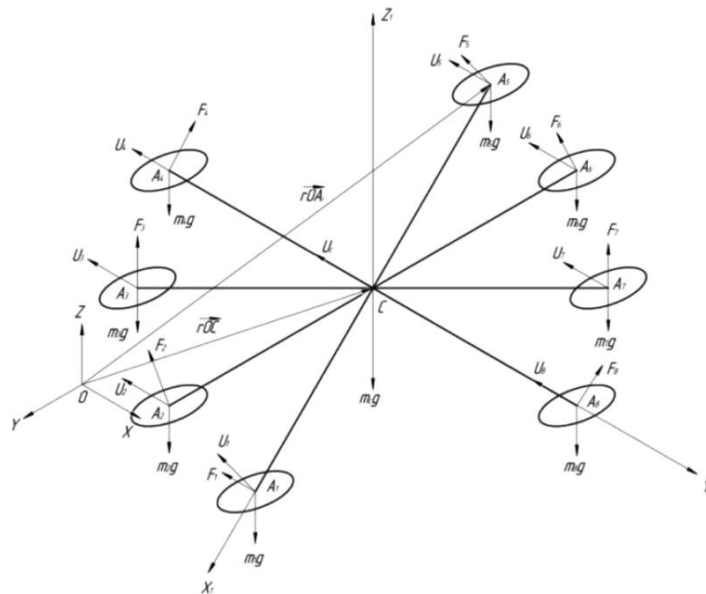


**Figure 1.** Calculation scheme of octocopter

The aerodynamic forces created by the rotors that act on the object are indicated by  $\vec{F}_i$ . The vector of action of these forces acts on the centers of mass of the rotors  $A_i$  and collinear axes  $CZ_1$ . The forces of gravity acting on the center of mass and the motors are designated as  $m_c g$  and  $m_i g$  respectively.

Resistance to body movement in the air  $\dot{R}_C^{(0)} = R_C(\dot{v}_C^{(0)})$ , and the lifting force of the body  $\dot{M}_C = \mu_C(\dot{\omega}_C)$ , where  $\mu$  – is the empirical drag coefficient,  $\dot{v}_C$  – velocity of the center of mass, and  $\omega$  – angular velocity of rotation of the center of mass of the octocopter.

$$\left\{ \begin{array}{l} \dot{v}_C^x = \frac{(\sin \psi \sin \varphi + \cos \psi \sin \Theta) \cdot (\sum F_i + R_x)}{m} \\ \dot{v}_C^y = \frac{(\cos \varphi \sin \psi \sin \Theta + \cos \psi \sin \varphi) \cdot (\sum F_i + R_y)}{m} \\ \dot{v}_C^z = \frac{\cos \varphi \cos \Theta \cdot (\sum F_i + R_z)}{m} - g \\ \dot{\omega}_{X_1} = \frac{\langle (F_1 + F_3) \cdot l_0 \cdot \sin 60^\circ \rangle - \omega_{Y_1} \omega_{Z_1} (J_i^{Z_1} - J_i^{Y_1}) - \omega_{Y_1} \sum J_i^Z \omega_i + M_{X_1}^C}{J^{X_1}} \\ \dot{\omega}_{Y_1} = \frac{\langle (-\langle F_1 + F_3 \rangle \cdot l_0 \cdot \sin 30^\circ + F_{2Z} \cdot l_0) - \omega_{X_1} \omega_{Z_1} (J_i^{X_1} - J_i^{Z_1}) - \omega_{X_1} \sum J_i^Z \omega_i + M_{Y_1}^C \rangle}{J^{Y_1}} \\ \dot{\omega}_{Z_1} = \frac{\langle (-[F_1 + F_3] \cdot l_0 \cdot d) - J_i^Z \dot{\omega}_i - \omega_{X_1} \omega_{Y_1} (J_i^{Y_1} - J_i^{X_1}) + M_{Z_1}^C \rangle}{J^{Z_1}} \\ \dot{\varphi} = \omega_{X_1} - (\omega_{Z_1} \cos \varphi - \omega_{Y_1} \sin \varphi) \tan \Theta \\ \dot{\Theta} = \omega_{Y_1} \cos \varphi - \omega_{Z_1} \sin \varphi \\ \dot{\psi} = \frac{1}{\cos \Theta} (\omega_{Z_1} \cos \varphi + \omega_{Y_1} \sin \varphi) \end{array} \right.$$

where  $m$  – octocopter weight,  $v_C^x, v_C^y, v_C^z$  – projections of the object's center of mass velocities on the OX, OY, OZ.  $J_i$  – sum of the moments of inertia of rotation around the axis  $A_i$ ,  $I_x, I_y, I_z$  – the moments of inertia of the axes,  $d$  – aerodynamic constant,  $l_0$  – length from the center of the vehicle to the engine  $A_i$ .  $\varphi, \psi, \theta$  – angles that set the position of the octocopter in space.  $X_1 Y_1 Z_1$  – projections of the angular velocity of the object on the axis  $CX_1 Y_1 Z_1$ .

**Simulation of octocopter flight.** This section assumes the creation of a Simulink circuit for creating a graphical display of a simulated flight and displaying graphs of changes in the coordinates of the octocopter's center of mass.

To test this mathematical model, a Simulink circuit was assembled (See Fig. 2).

Test results (See Fig. 3-6).

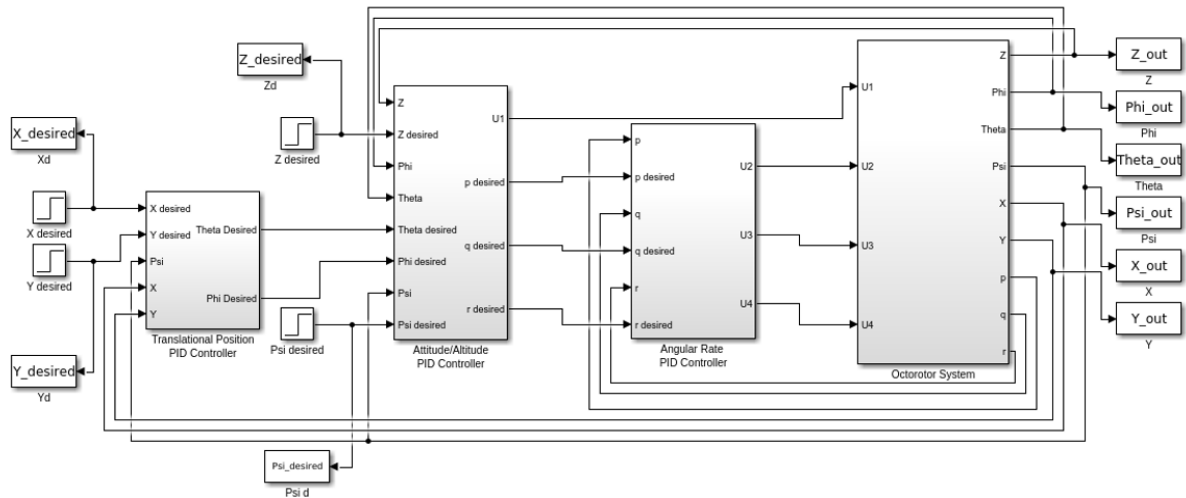


**Figure 2.** Simulink tested circuit

The program implements flight from the starting point (See Fig. 3), indicated by the intersection of the red and blue lines.

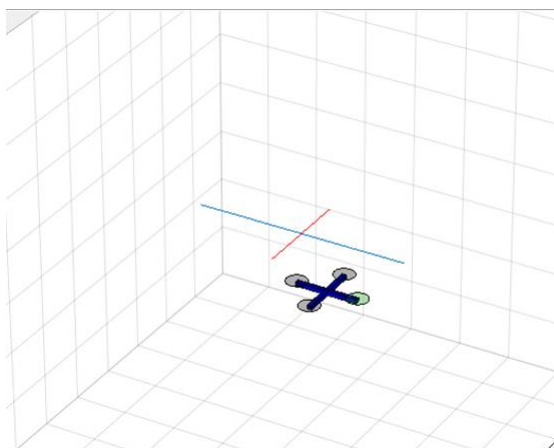


**Figure 3.** Flight simulation result

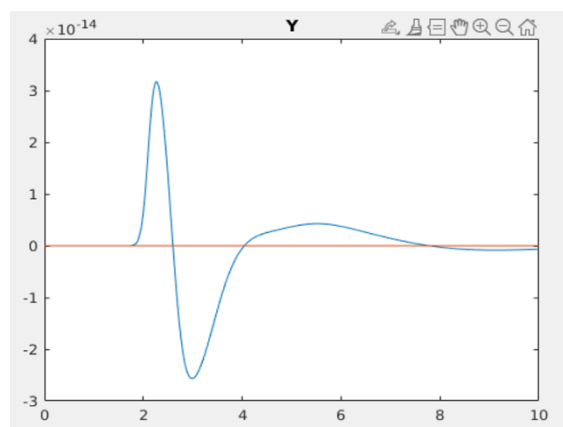


**Figure 5.** Estimation of the octocopter position along the ordinate axis

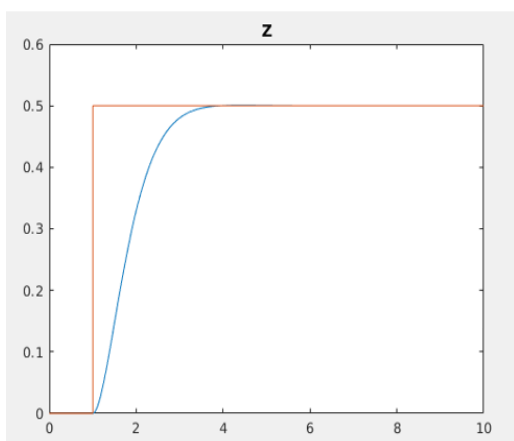


**Figure 4.** Octocopter altitude estimate

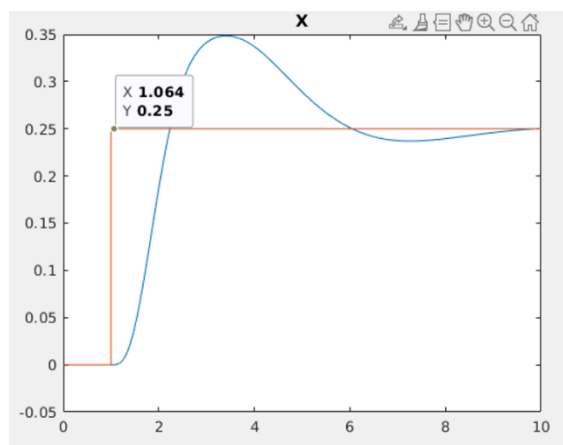


**Figure 6.** Estimation of the position of the octocopter along the abscissa axis

The movement of the object is close to the reference and depends on the setting of the PID controllers.

With sharper movements of the drone, the stabilization time of the drone in the final position increases and the chance of its flipping during flight increases, which entails turning off the engines on most flight microcontrollers.

At this stage, noises created by the simulated object and external influences, such as wind and the lifted load, which unevenly affect the octocopter rotors, are not taken into account.

In this work, a design scheme and a mathematical model of the octocopter's motion are proposed and a simulation of the object's flight is carried out. This work makes it possible to study the flight characteristics of an aircraft without building a prototype.

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**ВЛИЯНИЕ МЕТЕОРОЛОГИЧЕСКИХ ФАКТОРОВ НА РАССЕЙВАНИЕ  
ЗАГРЯЗНЕНИЙ В ПРЕДЕЛАХ ГОРОДА  
THE IMPACT OF METEORORLOGICAL FACTORS ON POLLUTANT  
DISPERSION IN THE CITY AREA**

**Аннотация.** Целью данной работы является исследование влияния метеорологических и техногенных факторов на рассеивание загрязняющих веществ в пределах города Севастополя и Балаклавы. В ходе анализа актуальных научных данных выявлено, что основными источниками загрязнения атмосферного воздуха города являются объекты теплоэнергетического комплекса, завод по переработке мусора, автомобильный транспорт. Установлено, что на перенос и рассеивание вредных примесей, поступающих в атмосферу, существенное влияние оказывает географическое положение города, наличие осадков, туманов, сила ветра и его направление, а также тепловые показатели атмосферы и солнечного излучения в различные периоды в течение года. Отражена динамика изменения в сторону уменьшения уровня загрязнения в течение 2019–2020 гг.

**Abstract.** The purpose of this article is to consider the influence of meteorological factors on the dispersion of pollutants within the city of Sevastopol and Balaklava region. The scientific data analysis has proven the main sources of atmospheric air pollution in the city of Sevastopol to be the energy and heating supply enterprises, the recycling factory and the automotive transport. It is stated that the presence of precipitation, fog, wind strength and its direction, the city's geographical position, the thermal parameters of the atmosphere and the varying solar radiation during the year have a significant impact on the transfer and dispersion of harmful impurities entering the atmosphere. The negative dynamics of pollution rate change in the course of 2019–2021 are given.

**Ключевые слова:** атмосферный воздух, загрязнение, осадки, выбросы загрязняющих веществ, рассеивание.

**Key words:** atmospheric air, contamination, precipitation, pollutant emission, dispersion

In cities, atmospheric air pollution is largely determined by climatic conditions and the emission of pollutants into the atmosphere from natural and anthropogenic sources. The concentration of pollutants in the surface layer of the city's atmosphere depends on the peculiarities of the climatic conditions of the city area. It is considered that the air temperature in the urban area is higher than that in the surrounding area. The presence of heated air masses over a man-made object, such as a city, is called a “heat island” [1].

Sevastopol has specific climate features due to the proximity of the second ridge of the Crimean Mountains, the presence of a large water body – the Black Sea and its bays. This causes the occurrence of a “heat island” in the central parts of the city and areas adjacent to the coastline, where the average air temperature is 0.5-1.0 ° C higher than the temperature of the surrounding area. The larger the size of the city, the higher the spread of the “heat island” (up to 3-5 times the height of buildings). In this regard, the formation of elevated inversion layers over the city is more likely, which can prevent the dispersion of harmful impurities and contribute to an increase in concentrations near the ground [2].

Sevastopol is characterized by the frequency of surface inversions from 30 to 40%; elevated inversions (0.01-0.25 km) from 5-8% in winter to 3-4% in summer.

The overall thermal balance of the city atmosphere is determined by the emission and consumption of solar radiation. The average annual value of total solar radiation for the city of Sevastopol is 4890 MJ/m<sup>2</sup>, of which 2445 MJ/m<sup>2</sup> account for direct solar radiation. In the annual course, with real cloud cover values, the maximum total radiation in the city falls in summer – 2445 MJ/m<sup>2</sup>, the minimum – in winter (489 MJ/m<sup>2</sup>). For direct radiation, the maximum is also observed in June – 473 MJ/m<sup>2</sup>, and in December practically no direct solar radiation is received. The daily course of total and direct radiation is determined by the altitude of the sun.

The annual course of the radiation balance is determined by the total radiation, effective radiation and albedo of the underlying terrain and is expressed by negative values from November to March (cold period), positive values from April to October (warm period).

While analyzing the annual course of weather parameters of Sevastopol, it should be noted that the maximum number of days with calm weather with zero wind is observed in spring and summer with the minimum in winter and autumn.

In general, the presence of precipitation, fog, wind strength and its direction, and thermal parameters of the atmosphere have a major impact on the transfer and dispersion of contaminants entering the atmosphere. In some periods, when these conditions contribute to the accumulation of harmful substances in the lower layer of the atmosphere, the concentrations of impurities in the air can increase significantly.

The enterprises leading in the atmospheric pollution of the city of Sevastopol are presented in Table 1, the total emissions of pollutants are shown in Table 2. It should be noted that the total pollution volumes decreased in 2020 compared to 2019 for most substances [3; 4].

The main sources of atmospheric air pollution in the city of Sevastopol are objects of the thermal power complex and motor transport. Also, a significant contribution to atmospheric air pollution is made by emissions of pollutants from the body of a solid waste landfill located in Pervomaiskaya Balka of the Balaklava Municipal District.

**Table 1.** The main enterprises-pollutants of the atmospheric air of the city of Sevastopol

| The main enterprises-pollutants                     | Emission of contaminants (thousand tons) | The overall emissions on the territory of Sevastopol (percent) | The category of harmful impact on the environment (number of objects) |
|-----------------------------------------------------|------------------------------------------|----------------------------------------------------------------|-----------------------------------------------------------------------|
| 1. The city water supply enterprise «Vodokanal»     | 0,441                                    | 6,6%                                                           | I – 1; II – 11; III - 21                                              |
| 2. LLC «Provision of urban amenities of Sevastopol» | 2,105                                    | 31,2%                                                          | I – 1; II – 1                                                         |
| 3. JSC «Mobile GTES»                                | 0,752                                    | 11,1%                                                          | II – 1                                                                |

|                                                                                                    |       |       |                   |
|----------------------------------------------------------------------------------------------------|-------|-------|-------------------|
| 4. The city power supply enterprise «Sevteploenergo»                                               | 1,299 | 19,2% | II – 53; III – 85 |
| 5. JSC «Balaklava Ore Management named after O.M. Gorky»                                           | 0,150 | 2,3%  | III – 4           |
| 6. The branch of LLC «The foreign trade association «Tekhnopromeksport» of the city of Sevastopol» | 1,993 | 29,6% | II - 1            |

**Table 2.** The amounts of atmospheric pollutant emissions from the stationary sources in Sevastopol, tons

|                                                                                                          | 2017 | 2018 | 2019 | 2020    |
|----------------------------------------------------------------------------------------------------------|------|------|------|---------|
| The amounts of atmospheric pollutant emissions from the stationary sources in Sevastopol (thousand tons) | 1709 | 4368 | 5378 | 3032.65 |
| <i>also</i>                                                                                              |      |      |      |         |
| solid                                                                                                    | 447  | 497  | 1286 | 159     |
| Gaseous and liquid                                                                                       | 1262 | 3871 | 4092 | 2873.65 |
| <i>also</i>                                                                                              |      |      |      |         |
| Sulphur dioxide                                                                                          | 154  | 99   | 32   | 18      |
| Carbon oxide                                                                                             | 221  | 448  | 507  | 71      |
| Nitrogen oxide (for NO <sub>2</sub> )                                                                    | 378  | 752  | 884  | 195     |
| Carbohydrates (w/o VOC)                                                                                  | 333  | 2266 | 2305 | 2436    |
| Volatile Organic Compounds                                                                               | 129  | 168  | 239  | 80.65   |
| Other gaseous and liquid                                                                                 | 47   | 138  | 125  | 73      |

Considering the impact of motor vehicles, it should be taken into account that the combustion products of various types of fuels for internal combustion engines contain various components that add to the environment pollution: carbon monoxide, unburned hydrocarbons, nitrogen oxides and soot. In addition to these compounds, aldehydes, sulfur oxides and other harmful (polluting) substances may be present in exhaust gases.

The recent dynamics shows a steady increase in the number of vehicles registered in Sevastopol. Analyzing the contribution of mobile sources to the total emissions of harmful (polluting) substances in the Sevastopol area, it can be concluded that gross emissions from motor vehicles exceed gross emissions from stationary sources.

The most polluted area of the city is Leninsky region, due to a number of factors: it being the central part of the city, the proximity of the railway station, large concentration of small boiler houses with a capacity of 2-3 MW (about 30 pcs.), violation of the sanitary zones, the hilly terrain. The Balaklava district can be considered to be the cleanest, with its main and only pollutant - the JSC "Balaklava Ore Management named after O. M. Gorky". An analysis of the indicators of a sharp increase in emissions of nitrogen compounds (more than 80% compared to previous years), combined with an increase in carbon dioxide emissions, which amounted to about 40%, may indicate a significant increase in the volume of natural gas burned.

The above said confirms the need to develop a system for monitoring the state of atmospheric air in Sevastopol. It is necessary to provide observation posts of the following categories:

- Stationary. These carry out regular measurements of the content of pollutants in air samples according to the full program (6 days a week). The distribution and number of posts in the city depends on the population, the size of the city, the climate, the location of enterprises and the terrain. The site on which the post is installed should be well-ventilated. The urban environment is developing – this leads to the fact that posts installed earlier in a sufficiently ventilated area may



eventually end up in blocked areas, thereby the information received may not be accurate for assessing air pollution in this area.

- Itineraries. These are specially equipped vehicles that regularly take air samples. They are used in cases when it is impossible to establish a stationary post or if it is necessary to study the pollution of the atmosphere in a certain area in more detail.

- Mobile. These are used to track atmospheric air pollution near large industrial enterprises. Such posts are installed at a certain distance from the source of pollution (from 0.5 to 10 km), in the direction of the emission flare.

All posts, regardless of the category, should be installed in an open area that is ventilated from all sides. It is also recommended to place posts in different zones (residential, industrial, recreation area) [5].

In general, the state authorities of the constituent entities of the Russian Federation and local self-government bodies organize work to regulate emissions of pollutants into the atmospheric air during periods of adverse meteorological conditions. For the city of Sevastopol, it is necessary to develop modes for adverse weather conditions that will determine the technological regulations of enterprises. The beginning of each mode should be determined by the weather forecast.

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## **ИЗУЧЕНИЕ ТЕОРИЙ ШАРОВОЙ МОЛНИИ THE STUDY OF BALL LIGHTNING THEORIES**

**Аннотация.** В данной статье рассматривается физическое явление – явление шаровой молнии. Автором проанализированы научные публикации, посвящённые истории изучения шаровой молнии. Данные представлены в хронологическом порядке. Хронологический порядок был использован для упрощения восприятия собранного материала. Анализ работ по проблеме исследования способствовал определению основных характеристик, которые свойственны явлению. Также в работе представлены результаты опроса граждан города Севастополь в рамках авторского эмпирического исследования. Исследование было направлено на определение уровня информированности граждан о специфике изучаемого физического явления. Все полученные результаты переведены в процентное соотношение. Сформулированы и выделены в определенный список действий рекомендации по безопасности населения при столкновении с данным феноменом. Были сформулированы выводы о проделанной работе.

**Abstract.** The article considers a physical phenomenon – the phenomenon of ball lightning. The author analyzed scientific publications devoted to the history of the study of ball lightning. The data are presented in chronological order. Chronological order was used to simplify the perception of the collected material. Analysis of works on the research problem contributed to the definition of the main characteristics that are inherent in the phenomenon. The paper also presents the results of a survey of citizens of the city of Sevastopol in the framework of the author's empirical research. The study was aimed at determining the level of awareness of citizens about the specifics of the studied physical phenomenon. All results obtained are converted into percentages. Recommendations on the safety of the population in the face of this phenomenon have been formulated and highlighted in a specific list of actions. Conclusions were formulated about the work done.

**Ключевые слова:** шаровая молния, свойства шаровой молнии, разряд, формирование шаровой молнии.

**Key words:** ball lightning, ball lightning properties, charge, the origin of ball lightning.

Ball lightning is one of the most mysterious natural phenomena. The history of observations of ball lightning started thousands of years ago. There are about 200 theories explaining this rare natural phenomenon, but none of them has received absolute recognition in the academic environment. In laboratory conditions, similar, but short-term phenomena were obtained in several different ways. But the question of the origin of natural ball lightning remains ambiguous. In the 20<sup>th</sup> century, not a single experimental stand was created where, on the scale of a natural phenomenon, ball lightning identical to the descriptions of eyewitnesses would be artificially reproduced. Ball lightning research aspects include mostly two elements: collecting and analyzing observations of ball lightning, as well as studying the processes that make up its nature.

The given research analyses various theories on the ball lightning phenomenon revealing its specifics in nature. The following tasks are outlined in the paper:

- 1) to study the theories on ball lightning;
- 2) to reveal the conditions necessary for the formation of ball lightning and its characteristics;
- 3) to conduct a survey on the awareness of ball lightning specifics;
- 4) to make guidelines and provide safety issues in case of ball lightning incident.

The relevance of this topic today is connected with the shortage of knowledge on ball lightning and its potential danger. The study is based on the theoretical and empirical (survey) research methods. The scientific significance of this research work lies in the fact that understanding the nature of ball lightning may prevent people from accidents.

There have been several statements about generating ball lightning in laboratories, but academicians are quite skeptical about these experiments. The question remains: “Are the phenomena observed in laboratory conditions identical to the natural phenomenon of ball lightning?”

Tesla's works at the end of the 19<sup>th</sup> century can be considered the first experiments and statements. In his brief note, he reports that, under certain conditions, igniting a gas discharge, after turning off the voltage, he observed a spherical luminous discharge with a diameter of 2-6 cm. However, Tesla did not give the details of his experiment, so it is difficult to reproduce that setup.

The first detailed studies of the luminous electrodeless discharge were carried out only in 1942 by the Soviet electrical engineer G. Babat. He managed to generate a spherical gas discharge inside a chamber with low pressure for a few seconds.

P. Kapitsa got a spherical gas discharge at atmospheric pressure in a helium medium. The addition of various organic compounds changed the brightness and color of the glow [1].

V. Trunov, in collaboration with the analytical chemist R. Trunova, on the basis of the theory developed by them, created an installation on which ball lightning was allegedly obtained. At the same time, the main initial data were recorded, which made it possible not only to understand the essence of the formation of ball lightning, but also to receive it artificially from a special energy source. Having received ball lightning, V. Trunov proved the full correspondence of the experimental data with his own theoretical foundations, while V. Trunov was the first in science to introduce the concept of “ball lightning state of energy” [4].

From the point of view of physics, ball lightning is an intricate natural phenomenon. In the first half of the 19<sup>th</sup> century, the French scientist physicist D. Arago collected information on 30 cases of observation of ball lightning. The data were limited, but many scientists of the 19<sup>th</sup> century, including Kelvin and Faraday, were inclined to believe that this was either an optical illusion or a non-electrical phenomenon. Since then, the quantity and quality of messages has increased. Now about 10 thousand cases of observation of ball lightning have already been documented.

We will present only a few major hypotheses about the nature of ball lightning, since there are too many theories (Table 1).

**Table 1.** Hypotheses for the generation of ball lightning

| The Author    | The hypothesis description                                                                                                                                                                          |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. P. Kapitsa | A standing electromagnetic wave arises between the clouds and the earth, and when it reaches a critical amplitude, in some place (most often, closer to the earth) a breakdown of air occurs, a gas |

|                |                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                | discharge is formed. In this case, the ball lightning appears, as it were, “strung” on the lines of force of the standing wave and will move along the conducting surfaces. The standing wave is then responsible for energizing the ball lightning [1].                                                                                                                                                                     |
| 2. A. Smirnov  | The ball lightning core is an interwoven mesh structure, a kind of airogel, that provides a strong framework while being lightweight. Only the carcass threads are plasma threads, not solid. And the energy reserve of ball lightning is entirely hidden in the huge surface energy of such a microporous structure. Thermodynamic calculations based on this model, in principle, do not contradict the observed data [3]. |
| 3. J.S. Ratis  | Ball lightning is a bunch of low-temperature radioactive plasma that appears in the process of $\beta$ -decay of radioactive phosphorus nuclei into a bound state. In other words, the root causes of the occurrence of fireballs lie outside the physics of an electric discharge in gases [5].                                                                                                                             |
| 4. D.J. Turner | Theory explains the entire set of observed phenomena by thermochemical effects that occur in saturated water vapor in the presence of a strong electric field. The energy of ball lightning here is determined by the heat of chemical reactions involving water molecules and their ions. The author of the theory is sure that it gives a clear answer to the riddle of ball lightning [6].                                |

In 1973, the properties of a “typical” ball lightning were published, based on an analysis of observational statistics:

- appears simultaneously with the discharge of lightning into the ground;
- has a spherical, cigar-shaped or disc shape with uneven edges, as it were, even “fluffy”;
- a diameter is from one centimeter to a meter;
- the brightness of the glow is approximately like a 100–200-watt light bulb, in the daytime you can see it well;
- the colors are very different, there are even black, but mostly yellow, red, orange;
- lasts from one second to several minutes, 15-20 seconds is the average time period;
- as a rule, it has a direction (up, down, more often - straight) at a speed of up to five meters per second, but it can just hang in the air, sometimes rotates around its axis;
- it practically does not emit heat, being “cold”. But heat can be released during an explosion (gas pipes);
- may be attracted to conductors – iron fences, cars, pipelines (gas, and explode with the release of heat), and some may simply pass through any matter;
- when disappearing, it can leave quietly, without noise, or loudly, with a clap;
- it often has the smell of sulfur, ozone or nitrogen oxides.

As part of the research, a survey was conducted by the author among the residents of Sevastopol to assess the awareness of people concerning this physical phenomenon.

The following questions were asked:

1. Do you know what ball lightning is?
2. Have you ever met it?
3. What do you know about its potential danger?
4. What distinctive features of this type of lightning do you know?
5. Do you know how to behave when meeting ball lightning?
6. Is it possible to predict the trajectory of the ball lightning?

In our empirical study, we interviewed 50 people living in the city of Sevastopol. The survey results showed the following percentages:

1. 45 people (90 percent) of the respondents know what ball lightning is, have an idea of this physical phenomenon.
2. 12 percent of the respondents (6 people) observed at least once such a physical phenomenon as ball lightning.
3. 80 percent of respondents (40 people) are aware of the potential danger of ball lightning.
4. The interviewees highlighted the following features of fireballs that they have ever heard or read somewhere:
  - a. Ball lightning can fly through the window.
  - b. Such lightning is an unpredictable glowing ball.
  - c. Ball lightning is impossible to control and an unpredictable process.
  - d. It may cause changes in psychic abilities.
5. Only 13 out of the respondents (26%) know what to do in case of this physical phenomenon.
6. 38 people or 76 percent of the respondents answered correctly that the trajectory of the ball lightning is impossible to predict.

Based on the data obtained, we can draw a conclusion, that it is necessary to share information about this physical phenomenon to enhance safety measures.

Ball lightning is a rare natural phenomenon that does not always cause harm, but it can be very dangerous for humans as well. The knowledge of ball lightning specifics reduces the risk of possible injury and damage. This study can be applied for educating people in order to minimize the potential harm caused by fireballs, as well as to raise public awareness.

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**БЕЗОПАСНОСТЬ СОВРЕМЕННЫХ АТОМНЫХ ЭЛЕКТРОСТАНЦИЙ:  
УКРОКИ КРУПНЕЙШИХ АВАРИЙ  
NUCLEAR SAFETY AT MODERN NUCLEAR POWER PLANTS:  
MAJOR NUCLEAR DISASTERS LESSONS**

**Аннотация.** В данной статье рассматриваются три крупнейшие аварии на атомных электростанциях: авария на Три-Майл-Айленд, авария на Чернобыльской АЭС и на АЭС Фукусима-1, а также их влияние на меры безопасности современных АЭС. В результате было выяснено, что, несмотря на большое негативное влияние ядерных аварий на все аспекты человеческой жизни, их исследование и анализ последствий позволяют предотвратить их повторение в будущем и способствуют развитию атомной энергетики. В ходе данного анализа были внесены изменения в правила безопасности на АЭС по всему миру, такие как улучшение подготовки специалистов, формулировка понятия «культура безопасности», множественные улучшения действующих моделей реакторов и т.д.

**Abstract.** This article analyzes three major nuclear accidents: Three Mile Island accident, Chernobyl disaster and Fukushima Daiichi nuclear disaster as well as their impact on safety measures of modern nuclear power plants. It was found out that in spite of huge negative impact of nuclear accidents on all aspects of human life, research and analysis of the consequences of these accidents make it possible to prevent their recurrence in the future and contribute to the development of nuclear power industry. As a result, safety rules were changed at nuclear power plants all over the world, such as: improving the training of specialists, formulation of the term “safety culture”, multiple improvements to existing reactor models, etc.

**Ключевые слова:** атомная электростанция, ядерная авария, авария на Три-Майл-Айленд, авария на Чернобыльской АЭС, авария на АЭС Фукусима-1.

**Key words:** nuclear power plant, nuclear accidents, Three Mile Island accident, Chernobyl disaster, Fukushima Daiichi nuclear disaster.

Safety is the most crucial aspect of nuclear power plants (NPP) operation. Safety issues have been of great importance from the very beginning of nuclear reactor development. Such issues are dealt with by many international organizations like International Atomic Energy Agency, World Association of Nuclear Operators, etc. Unfortunately, not every danger can be predicted and NPP accidents still occur. And three major nuclear accidents can be distinguished: Three Mile Island accident, Chernobyl disaster and Fukushima Daiichi nuclear disaster.

Three Mile Island accident occurred on March 28, 1979. The accident is assigned level 5 according to the International Nuclear Event Scale. There was a leakage of primary coolant on the second unit and loss of nuclear fuel cooling, respectively. The main reason of the accident was insufficient competence of specialists who were in the reactor control room when the accident occurred: they could not understand what was happening for a long time. However, the primary cause of the accident was equipment failure – the safety valve was unreliable. At the beginning of the accident it was jammed in the open position and continuous primary coolant leakage was caused.

To find out the reasons of this accident Presidential Commission comprising 12 specialists was established. The Commission gave detailed recommendations about steps that should be taken to train and retrain operators and shift supervisors so that they could ensure safe operation of the reactor at a NPP. The Commission's report also calls for special attention to a number of physical and technical problems. The first problem named was the danger of hydrogen explosion in a containment building that happened during Three Mile Island accident. The second was the importance of reliable circulation of primary coolant if emergency situation happens [3].

All these problems are solved in modern reactors. The training of specialists is carried out at the highest level nowadays. To prevent hydrogen explosion at modern NPPs containment building is filled with nitrogen or hydrogen, which are burnt with the help of low-temperature devices with catalyst. Reliable circulation of primary coolant is provided by a new type of pump [5].

Another equally important accident is Chernobyl disaster that occurred on April 26, 1986. It is considered to be the largest of its kind in the history of nuclear power generation industry, and it has level 7 according to the International Nuclear Event Scale. There was an explosion on the fourth unit of Chernobyl NPP that completely destroyed the reactor. Exact reasons of the accident have not yet been established, but according to the report of the International Nuclear Safety Group-7, the main reasons of the accident are:

- non-compliance of the reactor with safety standards and incorporated dangerous design features;
- low quality of the operating regulations in terms of safety;
- inefficiently effective regulatory regime and nuclear safety oversight, general lack of safety culture in nuclear matters both at the national and local levels [8, p. 24-25].

After the analysis of Chernobyl disaster causes term “safety culture” was formulated. Safety culture as a way of thinking, and actions of the person at work has two fundamental points: specific operator actions and high quality of control system that must form and encourage appropriate operator’s actions. Safety provided during NPP operation became the main and general task of all operating personnel of a plant [4, p. 194-201].

Additional studies of possible emergency situations and ways to overcome them were carried out at all Russian nuclear power plants, and appropriate modernization of safety systems was carried out [2]. As a result of measures taken, the probability of serious accidents of RBMK reactors has been reduced by more than two times. The system of operating personnel training was also significantly changed. Simulation training became the most important component of this system [1, p. 38-44].

One of the latest nuclear accidents is considered to be Fukushima Daiichi nuclear disaster. It was assigned level 7 according to the International Nuclear Event Scale. It occurred on March 11, 2011, as a result of huge earthquake in Japan and tsunami. The plant was left without electricity because of basement floating where switchgear assemblies, emergency generators and batteries were located. Blackout caused emergency cooling system failure and meltdown of nuclear fuel in the reactors of power units No. 1-3. Vapor-zirconium reaction resulted in accumulation of hydrogen and explosions of the detonating mixture at power units No. 1, No. 3 and No. 4.

This accident showed vulnerability of nuclear power plants to natural disasters. After this accident in Japan, most countries with operating nuclear power plants conducted thorough safety check of the plants [7]. As a result, additional improvements were identified:

- integration of an automatic system of filtered discharge of coolant from the containment in conditions of severe accidents;
- constant power supply of a steam generator in conditions of prolonged complete blackout of a NPP;
- provision of emergency power supply in conditions of prolonged complete blackout of NPPs.

Attention was also paid to the issues of population protection, as well as their evacuation and resettlement from contaminated by radioactive materials regions as a result of accidents at nuclear power plants [6].

After considering three world's largest nuclear accidents, we came to a conclusion that this is undoubtedly a negative experience for all mankind. They are responsible for great human sacrifices, both among NPP personnel and among the civilian population, as well as economic and political consequences. Nevertheless, each accident helps to improve safety measures taken in the nuclear power generation industry. Analysis of the accidents gives opportunity to prevent their future recurrence, as well as contributes to nuclear power generation industry development as one of the important industries of every country in the world.

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**ВЛИЯНИЕ ИОНОВ ЦИНКА НА ТРИХОПЛАКС**  
**THE OUTLINE OF THE EFFECT OF ZINC IONS ON TRICHOPLAX SP. H2**

**Аннотация.** В статье исследуется влияние ионов цинка на *Trichoplax* sp. H2, который культивировали в стеклянных чашках Петри. Обнаружено, что присутствие ионов  $Zn^{2+}$  привело к изменению формы и структуры пластинки. В результате  $Zn^{2+}$  замещает  $Ca^{2+}$ , и они не могут взаимодействовать друг с другом. Клетки трихоплакса перемещаются хаотично и независимо друг от друга, и связь между клетками нарушается. Следовательно, тело трихоплакса распадается на отдельные клетки.

**Abstract.** The article investigates the effects of zinc ions on *Trichoplax* sp. H2 which was cultured in glass Petri dishes. It is found out that the presence of  $Zn^{2+}$  ions has led to a change in the shape and structure of the plate. As a result,  $Zn^{2+}$  replaces  $Ca^{2+}$  and they cannot interact with each other. The trichoplax cells start moving chaotically and independently of each other and the connection between cells is disrupted. Consequently, trichoplax body disintegrates into separate cells.

**Ключевые слова:** пластинка трихоплакса, ионы цинка, клеточная адгезия, кадгерин, стеклянная чашка Петри.

**Key words:** Trichoplax plate, zinc ions, cell adhesion, cadherin, glass Petri dish.

*Trichoplax* has received much attention in recent years. It the most primitive of all multicellular animals – it digests algae and lives among algae in the Atlantic Ocean, Mediterranean and Red Seas. It is not as simple as previously thought.

*Tricoplax* (Placozoa type) is the simplest multicellular organism, up to 1 mm in size. It consists of about 50 thousand cells, which form 3 layers [1]. The movement of the animal is carried out due to the motion of the cilia and bending of the body [2]. It is believed that the integrity of the body is maintained by  $Ca^{2+}$ -bridges, because trichoplax is destroyed when it is transferred to distilled water. The aim here is to study the adhesion between *Trichoplax* cells and the process of impaired adhesion with the help of  $Zn^{2+}$  ions.

In the genome of *Trichoplax* sp. H2, calcium regulation genes encoding the following proteins were identified: voltage-gated Ca-channel TCav3, ATP-dependent calcium pump, multiple regulator calmodulin, intracellular store of  $Ca^{2+}$  ions calsequestrin, and the cell adhesion molecule cadherin.

It is known that  $Zn^{2+}$  ions to interact with  $Ca^{2+}$  ions during adsorption [3]. Inside a living cell, metals compete for binding sites with proteins according to a number of stability of Irving-Williams complexes:  $Mg^{2+}/Ca^{2+} < Mn^{2+} < Fe^{2+} < Co^{2+} < Ni^{2+} < Cu^{2+} \sim Zn^{2+}$  [4].

*Trichoplax* sp. H2 was cultured in glass Petri dishes with a diameter of 90 cm on mats of single-celled green algae *Tetraselmis marina*. Petri dishes with animals were placed in a room with a constant temperature  $t = 25\text{ }^{\circ}\text{C}$ . The animals were transplanted to a fresh mat every three weeks, and seawater (ASW) with a salinity of 35‰ was changed every week.

At least 15 individuals of *Trichoplax* sp. H2 were selected for each experiment. In total there were used more than 228 animals. 30-45 minutes before the start of the experiment, trichoplax were transplanted into plastic Petri dishes with ASW without algae for adaptation. From 10 to 25 microns of  $Zn^{2+}$  ions were added to the individuals that were in 50 ml of ASW and the animals were studied for different periods of time lasting up to a day. The study was conducted under light microscopes equipped with digital cameras at magnifications from 40 to 400 times.

Incubation of trichoplax in the presence of 20 microns of  $Zn^{2+}$  ions led to a change in the shape and structure of the plate, which manifested itself in thickening of its center, folding of the edges of the plate, as well as in dissociation of the animal into several parts or into individual cells. With an increase in the concentration of zinc ions from 10 to 25 microns, the number of individuals destroyed during the day increased (from 0 to more than 15%). Thus, when 25 microns of  $Zn^{2+}$  ions were added to the medium, the edges of the trichoplax became uneven, and the center thickened. After 2-4 hours of incubation, the animals stopped moving. This is due to the fact that the trichoplax cells moved chaotically and independently of each other, so even with the active motion of the cells, the trichoplax remained in one place and did not move in space. After 3-6 hours, the animal's body began to disintegrate into separate cells.

With the help of the Phyer2 server, 3D models of proteins were built, and with the help of the IonCom server, the number of binding sites of N metal ions with 3D models of proteins was calculated. The ratio  $NCa^{++}/NZn^{++}$  was used as coefficients in a system of five ordinary differential equations for the protein machine under study.

It is found that competing  $Zn^{2+}$  ions bind with all five types of proteins, which possibly leads to a violation of their functioning (Table 1).

**Table 1.** The number of binding sites of  $Ca^{2+}$  and  $Zn^{2+}$  ions on the studied proteins

| Protein                                                                                                                                                        | $Ca^{2+}$ | $Zn^{2+}$ |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------|
| TCav3 channel                                                                                                                                                  | *         | 79        |
| CA pump (ATP-dependent)                                                                                                                                        | *         | 34        |
| Calmodulin                                                                                                                                                     | 43        | 41        |
| Calsequestrin                                                                                                                                                  | 3         | 26        |
| Kadherin                                                                                                                                                       | 48        | 43        |
| Note: * - The IonCom server has not detected any sites, but theoretically there is at least 1 site in the middle of the channel/pump involved in ion transport |           |           |

For example, the analysis of the binding of  $Ca^{2+}$  and  $Zn^{2+}$  ions with cadherin showed that most of the amino acid residues with which  $Ca^{2+}$  and  $Zn^{2+}$  ions bind coincide (Fig. 1). This means that  $Zn^{2+}$  replaces  $Ca^{2+}$  and since cadherins are calcium-dependent proteins, when zinc binds to them, they cannot interact with each other and the connection between cells is disrupted.

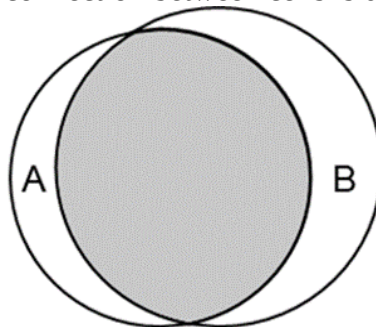


**Figure 1.** Venn's diagram for the binding sites of the initial  $Ca^{2+}$  and  $Zn^{2+}$  on cadherin

Set A is the number of binding sites for the first zinc, set B is the number of binding sites for the first calcium; the stained region is the total number of binding sites.

Trichoplax cells moved randomly and independently of each other, when carrying out field experiments with  $Zn^{2+}$  ions. Trichoplax remained in place even when cysteine was added to the medium and cells began to move actively.

$Ca^{2+}$  ions enter the cell through a voltage-dependent calcium channel when the membrane potential changes in the positive direction. Calcium binds to the regulatory protein calmodulin or is stored in the depot on the calcium-binding protein calsequestrin in the cytoplasm. The ATP-dependent calcium pump burns ATP and pumps  $Ca^{2+}$  ions against the gradient.  $Ca^{2+}$  binds to cell adhesion proteins – cadherins. Cadherins hold cells together.

It is revealed that the Ca-pump and Ca-channel are the slowest components, and cadherin and calmodulin are the fastest in numerical experiments, when the all mass of  $Ca^{2+}$  is concentrated on one of the arbitrary proteins. These data are consistent with the results of field experiments on the dissociation of the trichoplax body into individual cells using competitive  $Zn^{2+}$  ions.

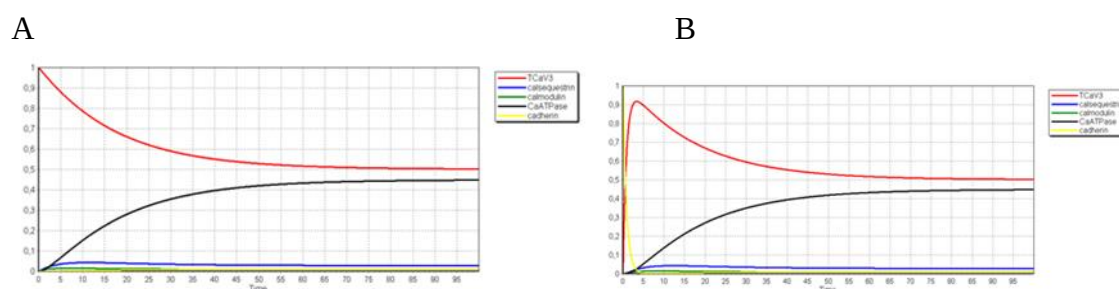


**Figure 2.** Numerical simulation results, A – “slow” Ca-TCav3 channel (red), B – “fast” cadherin (yellow).

Thus, cadherin sites are saturated with zinc instead of calcium, when zinc ions are added. As a result, cadherin is unable to carry out cell-cell adhesion. Therefore, neighboring cells stop interacting. Consequently, trichoplax “lives” for some time and then its body disintegrates into separate cells, as  $Ca^{2+}$ -bridges are destroyed.

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## **НОРМИРОВАНИЕ ШЕРОХОВАТОСТИ ФОРМЫ И РАСПОЛОЖЕНИЯ ПОВЕРХНОСТИ REGULATION OF SURFACE ROUGHNESS AND SHAPE DEVIATIONS**

**Аннотация.** В статье описаны основные особенности шероховатости поверхности, которая определяется как неровность, присущая производственному процессу. Описываются требования к шероховатости поверхности, так как они обеспечивают заданное качество продукции. Приведены параметры шероховатости поверхности, а также виды ее контроля.

**Abstract.** The paper outlines the main features of surface roughness which is defined as the irregularities which are inherent in the production process. The requirements for surface roughness are described, as they ensure the specified quality of products. The parameters of surface roughness as well as its control types are mentioned.

**Ключевые слова:** шероховатость поверхности, неровность, базовая длина, виды контроля, выступ.

**Key words:** surface roughness, irregularity, base length, types of control, protrusion.

Surface roughness is a component of surface texture and can be defined as the irregularities which are inherent in the production process. Roughness is quantified by the deviations in the direction of the normal vector of a real surface from its ideal form. If these deviations are large, the surface is rough; if they are small, the surface is smooth.

Differences in surface roughness obviously lead to visual differences, however, they also have an effect on a variety of other characteristics. This is why it is necessary to quantify surface roughness, that is, the microscopic asperity of surfaces.

Surface roughness is a collection of surface irregularities with relatively small steps at a sampling length (Fig. 1).

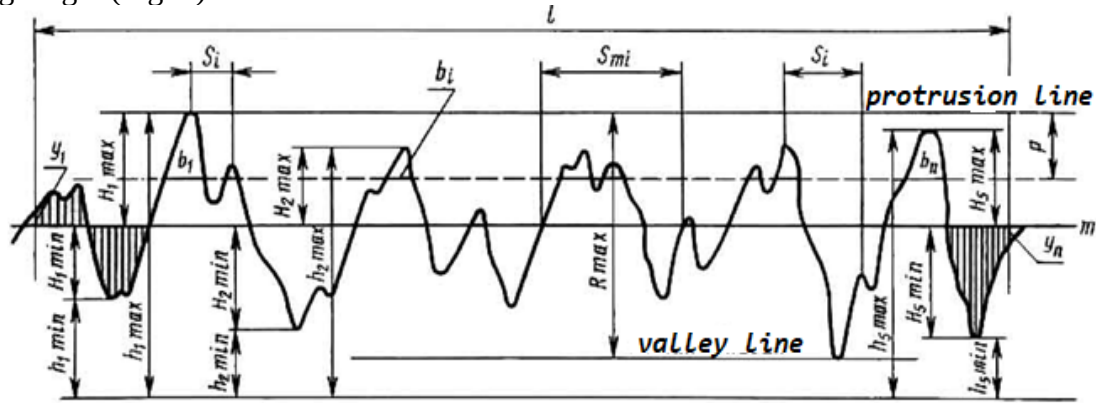


**Figure 1.** Surface Profile

To quantify roughness, six standard parameters are used: three high-rises ( $Ra$ ,  $Rz$ ,  $Rmax$ ), two step ( $Sm$ ,  $S$ ) and the parameter  $tp$  characterizing the relative reference length of the profile (Fig. 2). Let's have discuss more closely these parameters.

To begin with,  $Ra$  is the arithmetic mean of the absolute values of the profile deviations within the base length (Fig.2).

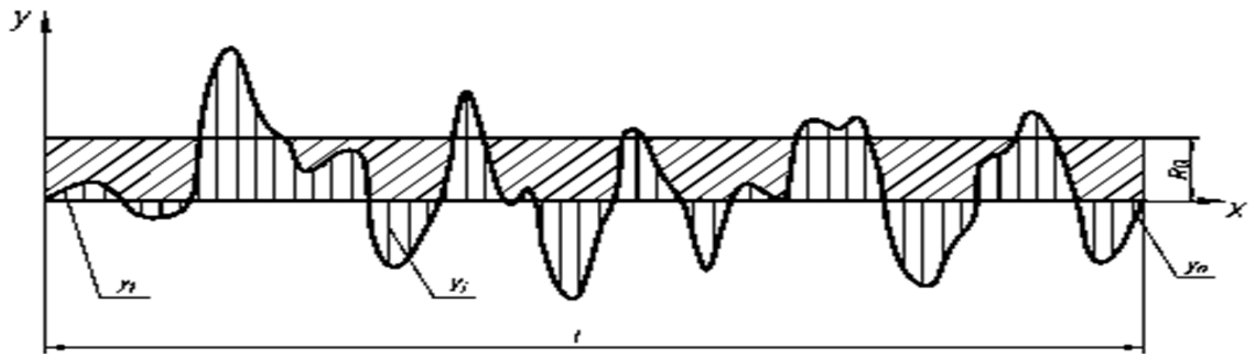


**Figure 2.** Arithmetic mean deviation of the profile  $Ra$

$$Ra = \frac{1}{l} \int_0^l |y(x)| dx \quad \text{or approximately} \quad Ra = \frac{1}{n} \sum_{i=1}^n |y_i|$$

$l$  – the base length;

$n$  – number of selected profile points at the base length.

$Rz$  – maximum profile height;  $Rmax$  – full profile height;  $Sm$  – the average pitch of surface irregularities;  $tp$  – the relative support length of the profile, where  $p$  is the sectional values of the profile [1].

It is GOST 2.309-73 that establishes the surface roughness designations and the rules for applying them on the product drawings. Roughness designations are affixed on all product surfaces made according to the drawing, regardless of their formation methods, except for surfaces whose roughness is not due to design requirements [1].

The maximum profile height  $Rz$  is the sum of the height of the largest profile protrusion and the largest profile valley within the base length.

It's worth mentioning that the surface roughness depends on the type of processing used to obtain a particular detail surface.

Moreover, the tracks direction depends on the type of processing, i.e. on the characteristic “pattern”. If, according to the operating conditions it is necessary for the surface irregularities to have a certain direction, then the requirements for such irregularity’s direction are established (Figure 3).

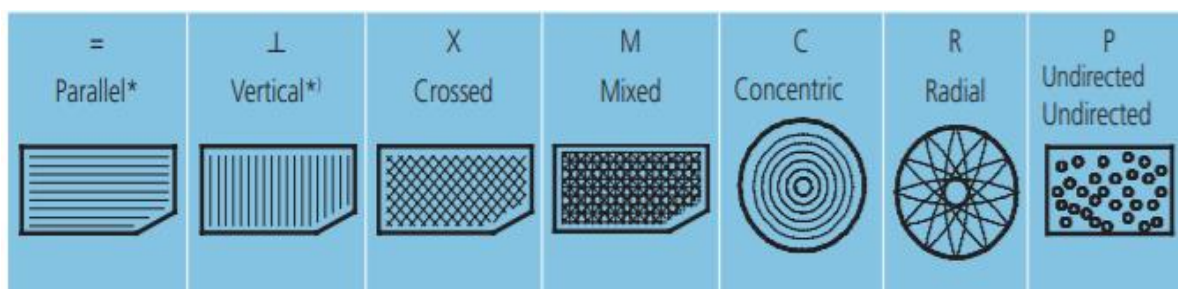


**Figure 3.** Designation of types of surface roughness directions

Furthermore, surface roughness control can be of two types: *acceptance* control of finished products aimed at determining the products suitability and identifying defects and *periodic* control of the product being processed in order to ensure a given surface roughness. On the other hand, surface roughness assessment is divided into two types of control: qualitative and quantitative.

Qualitative control of surface roughness is carried out by comparison with roughness samples. A surface roughness sample is a surface sample with known roughness parameters obtained by a certain processing method [3].

Quantitative control of roughness parameters is performed by non-contact (light section devices, shadow section devices, micro-interferometers, scanning measuring microscopes, reflectometers, laser, pneumatic devices, etc.) and contact (profilometers and profilographs) measuring instruments.

So, surface roughness plays a significant role in modern mechanical engineering, as it determines the performance of a mechanical component and how an object will interact with its environment.

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**ТЕОРЕТИЧЕСКИЕ И ПРИКЛАДНЫЕ АСПЕКТЫ РЕАЛИЗАЦИИ  
АВТОМАТИЗИРОВАННОЙ БИБЛИОТЕЧНОЙ СИСТЕМЫ В ИНФОРМАЦИОННО-  
ОБРАЗОВАТЕЛЬНОЙ СРЕДЕ ТЕХНИЧЕСКОГО ВУЗА  
THEORETICAL AND APPLIED ASPECTS OF THE IMPLEMENTATION OF AN  
AUTOMATED LIBRARY SYSTEM IN THE INFORMATION AND EDUCATIONAL  
ENVIRONMENT OF A TECHNICAL UNIVERSITY**

**Аннотация.** Рассмотрено значение вузовских библиотек как неотъемлемого компонента информационно-образовательной среды вуза. Поставлена проблема низкого уровня исследований в направлении автоматизированных библиотечно-информационных систем технических вузов на основе анализа научно-технической литературы. Выделены общие критерии качества электронных автоматизированных систем библиотек вузов. Описаны особенности организации, функционирования и развития библиотек технических вузов. Отмечены их отличительные черты по сравнению с библиотеками обычных вузов. Акцентируется внимание на ключевых показателях эффективности обслуживания конечных пользователей: оперативности, адекватности и полноте удовлетворения информационных потребностей. Определены объективные факторы, отрицательно влияющие на качество информационно-библиотечного обеспечения. Выявлены условия успешной модернизации библиотек технических вузов. Выведены дополнительные требования к автоматизированным библиотечно-информационным системам технического вуза.

**Abstract.** The importance of university libraries as an integral component of the information and educational environment of the university is considered. The problem of a low level of research in the direction of automated library and information systems of technical universities based on the analysis of scientific and technical literature is posed. Highlighted the general criteria for the quality of electronic automated systems of libraries of universities. The features of the organization, functioning and development of libraries of technical universities are described. Their distinctive features are noted in comparison with the libraries of ordinary universities. Attention is focused on

the key performance indicators of end-user service: efficiency, adequacy and completeness of meeting information needs. The objective factors that negatively affect the quality of information and library provision have been determined. The conditions for the successful modernization of libraries of technical universities have been identified. Additional requirements for the automated library and information systems of a technical university are derived.

**Ключевые слова:** высшее техническое учебное заведение, библиотечное обслуживание, информационно-образовательная среда, критерии качества, информационная грамотность, организационная структура, научно-техническая информация.

**Key words:** higher technical educational institution, library services, information and educational environment, quality criteria, information literacy, organizational structure, scientific and technical information.

Significant changes in the field of higher technical education that have taken place in recent years have seriously influenced the activities of university libraries. They were forced to adapt to new economic and organizational conditions, improve methodological approaches to work, introduce and actively use innovative technologies.

In view of the active growth of information volumes, changes in the key content of knowledge and skills of technical specialists, libraries are entrusted with the mission of forming the professional and social competence of graduates, as well as the development of such a fundamentally important skill as orientation in the flows of circulating information.

The quality of the received technical education depends mainly on the level of library services for technical universities. Providing information support for science and education at the university level is possible due to the availability of a modern technological base, organizational structures and information and educational resources. This fact necessitates the implementation of a number of innovations, the main goal of which is to expand the availability and improve the quality of library services.

The practical experience of libraries of technical universities, accumulated in recent years, represents an aggregate environment for researching effective methods for integrating innovative technologies into library activities. The material is also useful for studying and analyzing the prospects for the development of the library in the information and educational environment of a higher educational institution.

There are many scientific works, publications and dissertations that touch on the problems of libraries in the context of informatization, transformation of education and globalization of education in general. A significant part of the work is devoted to the evolution of the mission of university libraries. Especially noteworthy is the book of T.V. Eremenko, which presents a complex system of views and analysis of the development of a university library in the information and educational environment, which are based on a comparative analysis of the activities of Russian and foreign libraries [3].

A fairly substantial array of publications is devoted to comprehending the tasks and prospects for the development of modern university libraries. But despite the entire source series, it can be noted that very little research has been carried out on libraries of technical universities and, in particular, automated library and information systems (ALIS) in the information and educational environment of a technical university.

The purpose of this work is a theoretical and applied analysis of the main criteria for the quality of existing ALIS, highlighting the key criteria for the ALIS, which operates mainly in the educational environment of a technical university.

Based on the consideration of modern ALIS (1C: Library, IRBIS, Ruslan, KM-School, BiblioStor-M, Ibooks.ru, MARC), the following criteria were identified that should be met by ALIS



for full and effective functioning in the information and educational environment of a higher educational institution [1; 2; 4; et al.]:

- cataloging, that is, the various possibilities of the provided catalogs of heterogeneous publications;
- an extensive set of available types of exported and imported files that are supported by the system;
- the possibility of ordering literature – the availability of special forms of ordering literature and their use;
- accounting and storage of the fund – the functions of supporting the fund both paper and electronic materials;
- user service – remote options for user interaction with ALIS (availability and convenience of a personal account);
- statistics and reporting – the possibilities and flexibility of generating statistical and reporting documents upon request;
- support for forms for printing copies – the possibility and convenience of printing forms and e-books.

All of the above criteria can be applied to the ALIS of a technical university. To highlight additional criteria, it is necessary to trace the features of the development, organization and functioning of libraries of technical universities.

At the current evolutionary stage, scientific libraries are consistently transformed into information and educational centers, striving to improve their structure and optimize multifaceted activities, using the fundamental principles of quality management. The functioning and content of libraries as structural subdivisions of higher technical educational institutions are directly influenced by changes in the educational process. The basic needs of end-users are being transformed and significantly expanded, which requires constant professional development of personnel and operational modernization of the organizational structure.

The specific features of technical and technological universities determine the distinctive features of the backbone components of specialized university research libraries. In particular, these include documentary funds, material, and technical bases, users, and personnel.

The most significant difference is the content of the collection of library documents, the components of which are technical and applied fields. The formation and filling of the fund is determined by educational programs implemented on the basis of a higher educational institution, as well as by the type of scientific work and research.

Differences are also clearly expressed in the types of library structures that are present mainly in technical universities. These include the following departments: licensing and patent and invention, scientific and technical information, technical literature and documentation. The funds of these departments contain normative and technical documentation, descriptive documents of patents, certificates, industrial catalogs of enterprises, information and other information. Departments with scientific and technical information form and use a set of profile resources, thereby providing information support for scientific, research, production and design activities of a higher educational institution.

Another factor influencing changes in the structure of libraries of technical universities is the growth in demand for new specialties after graduation from higher education. This, in turn, is reflected in the acquisition of libraries with information resources and the orderly cataloging of all types of publications.

Libraries are constantly replenishing documentary and scientific and technical resources, guided primarily by the promising requests of end-users and the recommendations of the teaching staff. In most cases, libraries create and use their databases of domestic and foreign information resources. The basis of this process is the so-called diversification. Previously, the initial stage of the acquisition mechanism was the replenishment of the database with periodicals, but now there is an orientation towards electronic encyclopedias, abstracts, articles, books and dissertations.

Competently organized procedures for ordering price lists in electronic form, maintaining a card index for pre-ordering literature and registering book circulation form the basis for a complete, effective and efficient organization of acquisition that meets the growing needs of educational and scientific areas.

Most technical university libraries follow the trend of increasing the number of scientific and technical literature in foreign languages. In addition to this, the ability to search for materials on the global Internet and support the addresses of third-party educational resources on the relevant topics of educational programs and areas of scientific research is implemented.

The practical experience of libraries shows the need to form an effective methodology for servicing end users. The key performance indicators in this case are the efficiency, adequacy and completeness of meeting information needs.

Despite the progressive trends in the activities of libraries of technical universities, there are certain factors that negatively affect the quality of information and library provision of education. These include inadequate acquisition of individual electronic documents, inadequate study of theoretical and methodological aspects of modeling innovative areas of library activity. The low level of information literacy of some users also has a proper impact. To resolve such circumstances, advanced information technologies and profile training of users are used, aimed at increasing the information competence of users. In particular, bibliographic classes are used on the basic principles and structure of information and patent search [5].

According to the results of the research, for the successful transformation of the library of a technical university into a key information and educational center of an educational institution, the following set of conditions must be met:

- gradual creation and expansion of the library and information base (including the creation of a portfolio of educational and methodological complexes for the disciplines studied at the university, systematization and cataloging of Web-resources according to the profile of the university, and other introductions);
- generation of domain-specific databases;
- integration of both traditional and electronic resources into the libraries of the technical university;
- providing local and remote access of students to information and educational resources of the library system;
- development of electronic services (cataloging, distributed search, ordering, electronic delivery of documents);
- creation of a unified and integrated automated system for managing information and educational resources.

Based on the analysis of the features of the development, organization and functioning of libraries of technical universities, it can be stated that an automated library and information system should not only satisfy the previously listed general quality indicators, but also consider the specifics of an educational institution. The system should:

- to maintain organizational structures characteristic of a higher technical educational institution;
- to ensure the efficiency of search and processing of heterogeneous stock documents in a multithreaded mode;
- comply with the qualitative characteristics of the search and reference apparatus (including the electronic information catalog and the databases used);
- provide access to information and educational resources of both basic and additional education;
- have comprehensive documentation with the possible presence of elements of interactive learning.

Thus, the paradigm of education, changing as a result of progressive informatization, entails the transformation of the activities of scientific libraries of technical universities, thus modifying the vector of their development and conditioning the introduction of modern automated information

systems and technologies with fundamentally new significant requirements for their detailed design and software implementation.

The conducted research can serve as the basis for further design and development of an automated library and information system about the information and educational environment and the specifics of a higher technical educational institution.

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## **СТАБИЛИЗАЦИЯ ПОЛОЖЕНИЯ В НЕВЕСОМОСТИ STABILIZATION OF ZERO GRAVITY POSITION**

**Аннотация.** В статье описаны способы отталкивания в условиях невесомости с помощью гравитации, света и тепловой энергии для дальнейшей стабилизации или движения. Дано определение понятия «положение невесомости» с точки зрения нейтрализации гравитационной силы. Автор приходит к заключению, что на траекторию космического корабля во время полета с двигателем влияет его положение, то есть его ориентация в пространстве, которую необходимо стабилизировать и контролировать.

**Abstract.** The article describes methods of repulsion in zero gravity using weightlessness, light and heat energy for further stabilization or movement. The definition of the concept “zero gravity position” is given from the point of view of neutralizing the gravitational force. The author comes to the conclusion that the trajectory of a spacecraft during a flight with an engine is influenced by its position, that is, its orientation in space, which must be stabilized and controlled.

**Ключевые слова:** положения в невесомости, космос, стабилизация, гравитационная сила, невесомость.

**Key words:** positions in zero gravity, space, stabilization, gravitational force, weightlessness.

It is the zero gravity position that alleviates a pressure and keeps the passengers comfortable until they're out of orbit. Zero Gravity Position was developed by NASA to maximize comfort for astronauts heading into outer space in order to protect them as well. While entering space, there are some considerable forces acting on astronauts' bodies [6]. The zero gravity position is proved to benefit a whole body, the pressures of gravity being relieved. “Proper stabilization of the satellite can be insured if the extension of the boom is initiated when the boom axis is pointing upwards and within 2 55 degrees of the local vertical” [3, p. 2].

Roger Tengwall, John Jackson, Tasuku Kimura, S. Komenda, Morihiko Okada and Holger Preuschhof presented a metric description of man's posture in space where there is no gravity to activate the postural reflexes. The aim of our study is to analyzed zero gravity position in terms of its stabilization. One should take into consideration that the term “Zero gravity” (also zero-g) is the state of weightlessness. “This condition of weightlessness involves moving with gravitational force neutralization” [9].

“A state of apparent weightlessness, zero gravity is best experienced in outer space. When a spacecraft orbits the earth, the acceleration of the spacecraft, known as the centrifugal force, counterbalances the earth's gravity and neutralizes the gravitational force. In other words, the gravitational pull felt by the spacecraft becomes equal to the centrifugal force exerted on the spacecraft. This cancels out the effect of both forces and results in a state of zero gravity” [4].

One hundred kilometers from the Earth is the boundary of space, the so-called pocket line, but traces of the atmosphere can be traced to a height of a thousand kilometers, which means that you

can also push off from it, only in other ways [7]. The spacecraft “Kosmos-149”, launched in 1967, had a special ring that keeps the spacecraft flying straight.

The gravitational stabilization system was tested and then used on many satellites. These are Triad, Traak, GEOS-1, -2, Aeol, satellites of the ATS series, Explorer-38 (four gravitational hollow rods forming two-shaped radio telescope antennas, and a damping rod 96 m long) other. Several rods, which can be extended and extended, allow the satellite to be stabilized along three axes, rotated 180° to a new stable position (experimental satellite “Dodge”). Many satellites use magnetic orientation along with gravitational orientation [1] (Fig. 1).

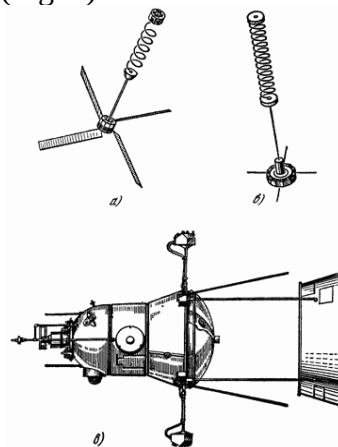


**Figure 1.** Satellites with passive stabilization systems:

- a) *US navigation satellite “1963-22A”*, b) *US research satellite “Traak”*; c) *Soviet meteorological satellite, “Kosmos-149” (“Kosmicheskaya strela”).*

Aerodynamic stabilization is one of the passive methods. The longitudinal axis of the satellite can be oriented in the direction of its flight if a stabilizer is placed in the tail part of the satellite, which has a greater “windage” than the satellite itself (according to the feathered boom principle). The aerodynamic stabilization system was supplied to the Soviet meteorological satellite “Kosmos-149” [1]. In this case, stabilization of the satellite in heel (elimination of rotation around the longitudinal axis) was achieved additionally with the help of two gyroscopes. As a result, the porthole of the satellite television equipment was directed at the Earth all the time. The satellite “Cosmos-320” also belonged to this type [1].

Simply stated if we want to rise higher where the molecules of the atmosphere do not reach, we need to have gravity. Any elongated satellite will oscillate around its axis, and then synchronize with it due to its elongation.

But how one can roll over quickly and along all axes at once? If your weight is reduced, you can fly off in the other direction. For this purpose, jet engines are used. They are placed perpendicular to each other in order to move and deploy the spacecraft along all three axes, but in order to rotate the spacecraft with jet engines, you need to take fuel with you and not a little, but you cannot take a lot of fuel with you, therefore they are most often used for docking ships and between planetary stations [6].

To turn over the large structures like the ISS, the method with jet engines is not suitable, therefore, a gyroscopic effect is applied. The ISS has 4 gyroscopes, three hundred kilograms each, the exact name of these gyroscopes is “gyrodine flywheel” (Fig. 2).

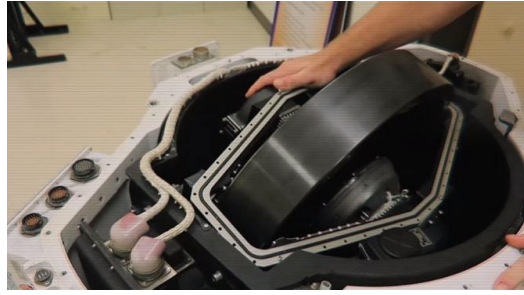


**Figure2.** Flywheel

But if one stop the flywheel operation, the apparatus will instantly spin in the other direction, so on the ground near the helicopters is another propeller on the stern so that they are not turned away by the movement of the main blades. In space, magnets are used to replace the second propeller, and if voltage is applied to them, then its magnetic field begin to touch on the earth's magnetic field. The Hubble telescope has three such magnets, just as a helicopter on the ground uses a propeller on the ground to unload the main rotor, and Hubble in space uses magnets to unload flywheels.

If we fly away from the earth so far, where there is no gravity, we can push off by means of the force of light. The photons hitting the body give it an impulse, and from the point of view of the wave theory of light, an electromagnetic wave, falling on a reflecting surface, excites currents in it, and, consequently, a magnetic field, which itself repels [8].

Such an engine provides speeds close to one of light in order to be reached, but an engine of this format is still considered hypothetical.

Mankind approached the principle of operation of this engine in the spacecraft “Pioneer 10” and “Pioneer 11” which carry messages to other civilizations have long left the solar system, instead of all the above methods, they are repelled with the help of radioisotope generators. In them, the decaying plutonium-238 releases energy, which slightly heats the apparatus, but it releases this energy in the opposite direction from the movement of the apparatus.

“Stabilization can be accomplished by setting the vehicle spinning, like the Pioneer 10 and 11 spacecraft in the outer solar system, Lunar Prospector, and the Galileo Jupiter orbiter spacecraft, and its atmospheric probe. The gyroscopic action of the rotating spacecraft mass is the stabilizing mechanism” [5, p. 650].

Currently a few different inertial reference technologies are in use on spacecraft. “The newer technologies depart from employing the mechanical gyroscopic effect, in favor of different physical principles...” [2]: Mechanical gyros (fig. 3), Laser ring gyros and fiber-optic laser gyros, hemispherical resonator gyros.

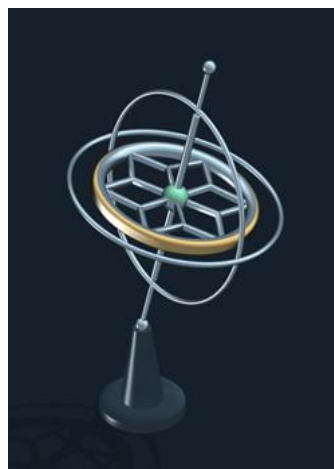


**Figure 3.** Mechanical gyros.

“The analytical theory upon which passive gravity gradient stabilization-is-based is well known” [3, p. 3]. Alternatively, a spacecraft may be designed for active stabilization. Another method for achieving stabilization is to use electrically-powered reaction wheels, also called momentum

wheels. We can conclude that the path a spacecraft takes during powered flight is directly influenced by an attitude that is its orientation in space. Its attitude must be stabilized and controlled. It becomes imperative to understand the effects of zero gravity and devise ways to counter those with our sights set on establishing human life beyond Earth's gravitational pull. The day scientists resolve those concerns will be in future.

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**ПЛАВУЧИЕ АЭС – БУДУЩЕЕ МАЛОЙ АТОМНОЙ ЭНЕРГЕТИКИ  
FLOATING NUCLEAR POWER PLANTS – THE FUTURE OF SMALL-SCALE  
NUCLEAR POWER GENERATION INDUSTRY**

**Аннотация.** В статье рассматривается единственная в мире плавучая атомная теплоэлектростанция «Академик Ломоносов», которая относится к атомным станциям малой мощности. Данная станция была спроектирована с целью обеспечения электроэнергией удаленных труднодоступных территорий Российской Федерации, а также объектов промышленности стратегического значения. Она круглогодично снабжает теплом и электричеством удаленные районы Арктики и Дальнего Востока. Вместе с тем плавучая атомная теплоэлектростанция помогает решить две основные задачи: первая касается замещения выбывающих мощностей Билибинской атомной электростанции и Чаунской тепловой электростанции; вторая – это обеспечение энергией основных горнодобывающих компаний, находящихся на западной Чукотке в Чаун-Билибинском энергоузле. Также в статье рассмотрены основные достоинства плавучих атомных станций, показан их потенциал в составе водоопреснительного комплекса, проанализированы проблемы использования станций, а также приведены возможные страны-заказчики плавучих АЭС, исследованы их особенности как экспортеров.

**Abstract.** The article discusses the world's only floating nuclear thermal power plant “Akademik Lomonosov”, which is a small-capacity nuclear power plant. It was designed to supply electric power to remote hard-to-reach territories of the Russian Federation, as well as to strategically important industrial facilities. It supplies year-round heat and electricity to remote areas in the Arctic and the Far East. At the same time, the floating nuclear thermal power plant helps solve two main problems: the first concerns replacement of retired capacities of the Bilibino nuclear power plant and the Chaun thermal power plant; the second is supplying energy to the main mining companies located in the Chaun-Bilibino power hub in western Chukotka. The article also discusses the main advantages of floating nuclear power plants, demonstrates their potential as a part of the desalination complex, analyzes the problems of using the plants, discusses possible customer countries of floating nuclear power plants, and investigates characteristics of these countries as exporters.

**Ключевые слова:** плавучая атомная электростанция, плавучий энергоблок, атомная электростанция малой мощности, водоопреснительный комплекс, «Академик Ломоносов».

**Key words:** floating nuclear power plant, floating power unit, low capacity nuclear power plant, desalination complex, “Akademik Lomonosov”.

Energy is very important in today's world. After all, everything we use requires energy. And the further away, the more energy we need. Many Russian and foreign scientists believe that nuclear industry is the most promising direction for the development of energy systems, despite all the



dangers associated with radioactive materials handling, which is the main fuel for nuclear power plants.

Floating power unit (FPU) in Russia is highly demanded and this is particularly true for the regions of the Far North and the Far East, which are not a part of the united energy system and require reliable and economically-viable energy sources. The FPU can also be used as a part of a water desalination complex, then reverse osmosis technology or multistage evaporation units are used. Many countries in Africa, Asia, and Europe, which experience a great shortage of fresh water, are interested in these complexes [2].

The only example of a FPU today is the floating nuclear thermal power plant (FNPP) “Akademik Lomonosov”, which is classified as a low-capacity nuclear power plant. This project is made for the purpose of a reliable year-round supply of heat and electricity to remote regions such as the Arctic and the Far East. FNPP helps to solve two main problems: the first concerns the replacement of retired capacities of the Bilibino NPP and Chaun thermal power plant; the second is supplying energy to the main mining companies located in the Chaun-Bilibino power hub in western Chukotka [3, p. 2-3].

The FNPP consists of:

1. Floating power unit with two KLT-40S reactor installations and two steam-turbine plants.
2. Hydraulic engineering facilities, which ensure installation, FPU shoring, and transferring generated heat and power to the shore.
3. Onshore facilities created to transfer the generated electric and thermal energy to external networks for onward distribution to consumers [1].

The hull of the floating power unit is all-welded, divided by bulkheads into compartments forming two units – residential and technological. The technological unit contains two reactor installations, two steam-turbine plants, auxiliary systems and equipment, which provide normal operation of the power unit. The reactor compartment and the nuclear fuel handling compartment are in the central part of the FNPP. These compartments are separated from the rest ones by watertight bulkheads, which function as biological and physical shielding. Turbine generator and electrical engineering compartments are in the bow of the vessel. Auxiliary installations compartment and residual unit are at the back of the vessel, where dormitories and other facilities are located. The power plant is divided into two parts – a nuclear (main) and a non-nuclear (auxiliary). The nuclear part includes two KLT-40S reactor installations with thermal capacity of 150 MWt each and two steam-turbine plants with turbine generators with an electrical capacity of 35 MWt [2]. The total capacity of the FNPP is 70 MWt of electricity and 300 MWt of thermal power (Figure 1).

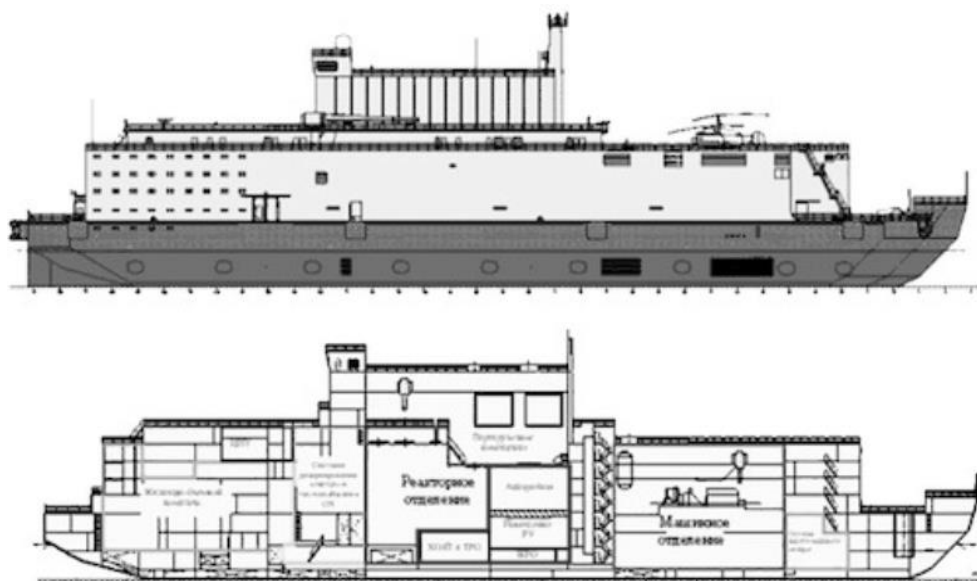


**Figure 1.** Hull of the floating power unit

JSC Concern “Rosenergoatom” is preparing FNPPs for mass production, and carries out work on searching for prospective sites for FNPP establishment in the Chukotka Autonomous District, Republic of Sakha (Yakutia), and other regions of Russia. Recent assessments show that it is economically viable to use FNPPs for supplying energy to natural gas production and transportation facilities when exploiting hydrocarbon and other mineral deposits. Many foreign countries are also interested in these plants, including countries in Asia, Africa, Latin America and the Middle East. The potential use of FNPPs in these foreign countries is as a part of nuclear desalination complexes [2].

China has also commended the potential benefits of mobile nuclear power plants. Under the leadership of China National Nuclear Corporation, a consortium of Chinese organizations was established to design and build low capacity floating nuclear power plants. They will be sent to the places where they are needed and will be used, for example, to operate drilling units of offshore oil and gas deposits, to supply electricity to remote facilities of the islands in the South China Sea, to heat and desalt, or these FNPPs could be used as engines for powerful nuclear-powered icebreakers. Plans are underway to build 20 floating nuclear power plants in China [2].

Thus, the operation of the FPU helps to solve the following problems:

- electricity supply to remote and inaccessible areas of the Russian Federation and CIS countries as well as industrial facilities of high strategic importance;
- desalination of sea water;
- reduction of northern deliveries of fossil fuels.

We can conclude that objective circumstances demonstrate the increasing relevance of small-scale nuclear power generation industry not only in Russia, but also in other countries all over the world.

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**АНАЛИЗ ОСОБЕННОСТЕЙ ЭКСПЛУАТАЦИИ ЯДЕРНОГО ТОПЛИВА  
НА РЕАКТОРНОЙ УСТАНОВКЕ ВВЭР  
ANALYSIS OF NUCLEAR FUEL OPERATING FEATURES AT WWER REACTOR**

**Аннотация.** В статье анализируются особенности эксплуатации ядерного топлива, в связи с чем основное внимание направлено на главный конструктивный элемент активной зоны гетерогенного ядерного реактора – тепловыделяющий элемент. Рассмотрены различные виды ядерного топлива, применяемого на реакторных установках действующих атомных электростанциях России, и оценено его современное состояние. Главной задачей любого топлива является обеспечение работоспособности тепловыделяющих элементов и тепловыделяющих сборок в течение срока их службы до проектных значений выгорания топлива. И, помимо этого, его эксплуатация должна способствовать снижению себестоимости получаемой электроэнергии. С этой целью были изучены различные составы ядерного топлива: ядерное топливо с увеличенной топливной кампанией, с повышенной безопасностью в случае аварии (уран-эрбиевое топливо), а также ядерное топливо с минимальными радиоактивными отходами в ходе эксплуатации реактора (РЕМИКС-топливо и МОХ-топливо). Также рассмотрены перспективные разработки топлива и эффект достижимый за счет их внедрения.

**Abstract.** The article considers the peculiarities of nuclear fuel operation; therefore, the main attention is given to the fuel element being the main constructive element of the heterogeneous reactor core. We have considered different types of nuclear fuel operating at Russian nuclear power plants; its current state has also been examined. The main task of any fuel is to ensure the fuel rods and fuel assemblies operability during their operating life up to the design values of fuel burnout. And in addition, its operation should contribute to the electricity cost reduction. For this purpose, various compositions of nuclear fuel have been studied, namely, nuclear fuel with an increased fuel campaign, with increased safety in the event of an accident (uranium-erbium fuel), as well as nuclear fuel with minimal radioactive byproducts after reactor operation (REMIX-fuel and MOX-fuel). Promising fuel developments and the effect achieved through their implementation are also considered.

**Ключевые слова:** ядерное топливо, атомные электрические станции, ядерная энергетика, тепловыделяющий элемент, тепловыделяющая сборка.

**Key words:** nuclear fuel, nuclear power plants, nuclear power, fuel element, fuel assembly.

Any reactor operation is impossible without using nuclear fuel. It is a vital element of any reactor type that contains the required amount of one of the fissionable isotopes to produce a fission chain reaction. Most nuclear power reactors require enriched uranium fuel in which the proportion of U-235 isotope has been raised from the natural level of 0.7 % to at least 3.5 %. A great variety of fuel types has been designed, its usage depending on the required result of the reactor operation. The aim

of the article is to study a diverse fuel composition, fuel pellet production technology and thermophysical characteristics while operating in various operating modes.

The nuclear fuel cycle is a sequence of periodic production processes from the fuel extraction to the radioactive waste management. Nuclear fuel cycles differ in details depending on the fuel type and specific conditions, but their general concept remains the same.

The fuel element is the main structural element of the heterogeneous nuclear reactor core, which contains nuclear fuel. In fuel rods, U-235, Pu-239 or U-233 heavy nuclei are split resulting in the release of thermal energy, which is subsequently transferred to the coolant. Fuel rods consist of a fuel core, a shell and end plugs. The fuel element type depends on the type and purpose of the reactor, as well as coolant parameters. The fuel element must provide a reliable heat removal from the fuel to the coolant.

In most modern power reactors (WWER-1000, WWER-1200, WWER-1300), the fuel element is a set of sealed tubes made of special alloys with a diameter of 9.1-13.5 mm and a length of several meters, which are filled with nuclear fuel pellets. Dozens of tubes and mounting elements are combined into a single structure.

Whatever nuclear fuel is being developed for nuclear reactors, it must ensure the operability of fuel rods and fuel assemblies during the service life of the fuel assemblies up to the design values of fuel burnout. And its operation should contribute to the electricity cost reduction. For this purpose, a diverse fuel composition and fuel pellet production technology are being developed, thermophysical characteristics are being studied while operating in various operating modes.

Let's consider different nuclear fuel types commonly used at Russian NPPs.

The first nuclear fuel type is one with an advanced fuel cycle. The reactor modernization is focused on increasing fuel cycle to reduce energy costs for own needs, to decrease the frequency of spent fuel discharge, to increase the depth of nuclear fuel burnout. A high duration of fuel cycle can be achieved by increasing the initial fuel enrichment, as well as by introducing absorbing materials into nuclear fuel composition capable of burning out gadolinium, and erbium. In addition, the use of burn-out absorbers provides several benefits:

- minimizing the number of movable absorbing rods;
- increasing the initial fuel loading into the reactor core, which is required to increase fuel cycle without increasing the initial reactivity; to ensure equal energy production of the reactor;
- regulating the temperature coefficient of reactivity increasing the fuel burnout.

However, increasing the fuel burnout leads to an uneven burnout of nuclear fuel in height, weakening the strength characteristics of the fuel element. In emergency situations it can result in its destruction increasing power of residual heat from spent fuel assemblies [3, p. 40].

During the transition to a longer fuel cycle, it is necessary to increase the absorber content in the fuel, which will lead to the thermal conductivity decrease and the thermal stress increase of the fuel element. This may cause local coolant boiling on the surface of the fuel element shell. It should be said that achieving a fuel cycle of up to 24 months is possible only with increased values of nuclear fuel enrichment with U-235 isotope to over 5%.

Another type of nuclear fuel is one with increased safety in case of an accident. Uranium-erbium fuel can be referred to as nuclear fuel with increased safety. The essential difference of the erbium absorber is that increasing the coolant temperature the neutron spectrum shifts towards a higher energy, while the neutron flux increases. It means that neutron absorption increases.

This fuel is used at Leningrad nuclear power plant with RBMK-1000 reactors. The use of uranium-erbium enriched up to 2.6% with U-235 and with erbium content of 0.41% has been taking place since April, 1996, and uranium-erbium fuel enriched up to 2.8% with erbium content of 0.60% since December, 2001. Thus, fuel enrichment increases in the RBMK-1000 fuel assemblies along with the burn-out absorber, namely erbium oxide, led to the reactor safety increase, as well as to the reduction of negative impact on the environment due to:

- reducing the number of steam reactivity coefficient to the required safety limit without using additional absorbers in the core;

- reducing the maximum power of the fuel assembly that results in reducing negative effects in design and emergency situations;
- reducing the unevenness of the energy release fields within the reactor;
- reducing the number of additional absorbers, even before a complete core discharge, if needed, and, consequently, it results in reducing high-level radioactive waste [3, p. 41].

Thus, the use of erbium as a burn-out absorber makes it possible to improve the temperature coefficient of the moderator reactivity. Absorption cross-section of thermal neutrons of erbium is two times lower than that of gadolinium, up to energies of 0.1 eV. At neutron energies of above 0.1 eV the absorption cross-section of erbium increases, and the gadolinium cross-section decreases even at a greater rate. The cross-section values are compared at the neutron energy of about 0.4 eV [1, p. 143].

The disadvantage of the erbium absorber is the fuel cycle reduction because erbium is not burnt completely at the end of fuel cycle. However, this disadvantage can be compensated by the fuel enrichment increase.

### **Nuclear fuel with minimal radioactive byproducts after reactor operation**

REMIX-fuel is made from an unsplit mixture of uranium and plutonium released from the spent nuclear fuel during reprocessing with the addition of uranium enriched with U-235 content of about 16-17%. In MOX-fuel, plutonium is mixed up with depleted uranium, while the plutonium weight content is 8-10%. Plutonium weight content does not exceed 3.5% in REMIX-fuel.

Since the technology of REMIX-fuel differs from the MOX-fuel one, it affects the quantitative and qualitative composition of spent fuel and the possibility of re-exploitation of this fuel in the reactor core. The main advantage of REMIX-fuel is that it can be reused in the reactor core without significant degradation. In MOX-fuel production the depleted uranium is used with a sufficient plutonium addition preventing its reuse in thermal reactors.

Regarding REMIX-fuel loading into the WWER-1000 core, the neutron-physical characteristics of WWER-1000 reactor core make it possible to load the core fully and with MOX-fuel there is a possibility of loading 30% of nuclear fuel into WWER-1000 core.

However, the operation of regenerated fuel in the WWER core doesn't look promising. During reactor operation, U-236 isotope is formed from U-235 isotope due to the radioactive neutron capture, which can be split only by fast neutrons. In addition, the frequent use of regenerated fuel leads to a significant U-236 increase reducing the reactor reactivity, and there is a decrease in the proportion of fissile plutonium isotopes and an increase in the proportion of non-fissile plutonium isotopes. After each recycling the U-236 amount increases, respectively, it leads to U-232 increase. In addition, the longer the refueling campaign is, the more U-236 is accumulated requiring higher nuclear fuel enrichment with U-235 [2, p. 102].

The disadvantage of both REMIX-fuel and MOX-fuel is the necessity to ensure an increased radiation safety. In addition, using these fuels increases significantly costs of its production, transportation, storage, processing and disposal of highly radioactive waste generated during the regenerated fuel production. The overall positive quality is preserving natural resources due to the spent fuel reuse and its involvement in the reactor operation.

Further development of nuclear engineering is associated with an increased fuel use. For this purpose, technology to produce regenerated fuel is being developed; fuel reuse in the reactor core will save costs of the natural uranium extraction, as well as will reuse a huge amount of spent fuel, and, therefore, will reduce the accumulation rate, which will eventually increase the economic efficiency.

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**ПЕРСПЕКТИВЫ И ВОЗМОЖНОСТИ РЫНКА ДЕТЕЙЛИНГ УСЛУГ  
В ГОРОДЕ СЕВАСТОПОЛЬ  
DETAILING SERVICES MARKET PROSPECTS AND OPPORTUNITIES  
IN THE CITY OF SEVASTOPOL**

**Аннотация.** В статье представлена динамика уровня автомобилизации города Севастополя, проанализирована информация по поисковому запросу «детейлинг» в городе Севастополь, а также рассмотрены причины, по которым автовладельцы предпочитают пользоваться услугами за пределами территории Крым. Рассмотрены перспективы и возможности рынка детейлинг услуг в городе Севастополь.

**Abstract.** The article presents the dynamics of the level of automobiles in the city of Sevastopol, analyzes the information on the search query “detailing” in the city of Sevastopol as well as considers the reasons why car owners prefer to use services outside the territory of Crimea. The detailing services market prospects and opportunities in the city of Sevastopol are revealed.

**Ключевые слова:** детейлинг, автомобильный сервис, детейлинг услуги, перспективы и возможности рынка детейлинг услуг.

**Key words:** detailing, car service, detailing services, detailing services, market prospects and opportunities.

Sevastopol is a city of federal significance, located in the south-west of the Crimean Peninsula, on the Black Sea coast. The city, rich in cultural and historical heritage, natural resources and favorable climatic conditions, which contribute to the successful implementation of state and regional programs for its socio-economic development, creates conditions for the investment attractiveness of the city for Russian and foreign businesses and ensures a decent standard of living for Sevastopol residents. The trajectory of the city's development has changed since 2014 after joining the Russian Federation, the service and service market has increased.

The emergence of new services in the automotive sector, which are aimed at improving the quality of services and service, plays an important role in the infrastructure of Sevastopol. Given the growing competition, many companies want to differentiate themselves and strive to provide maximum service to their customers.

As the number of cars grows, the demand for services is increasing.

Based on the statistics of the level of automobiles in Sevastopol for 2016-2019: in 2016, there were 41.1 cars per 1000 inhabitants, in 2017 – 217.4 cars, in 2018 – 292.9, and in 2019 – 302.9 (Figure 1) [2; 4].

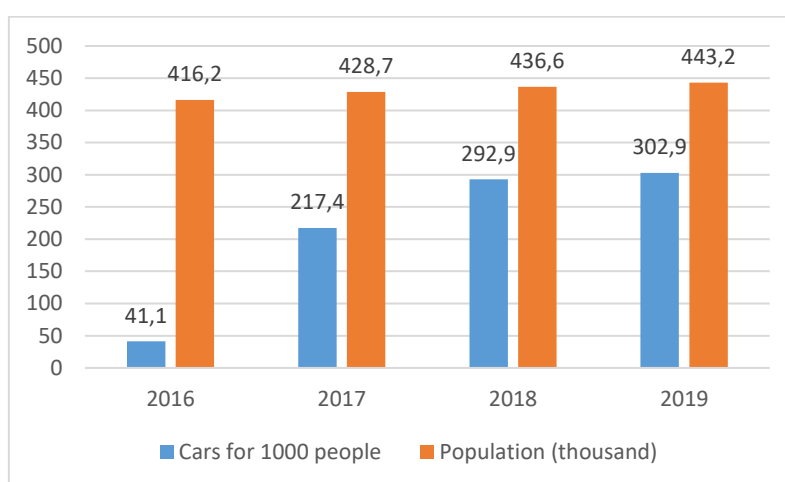


**Figure 1.** The amount of automobiles in Sevastopol for 2016-2019

Analyzing the statistics, there is a fairly high increase in the number of cars, and accordingly, the number of interested people in the services for finalizing and caring for the car is also growing.

This audience is quite versatile – someone wants to stand out from others, someone wants to keep the appearance provided by the manufacturer for as long as possible, and someone is preparing a car for sale or bought a car from hands and wants to prepare for operation. There are many services currently available to meet these clients' needs.

What is detailing?

Detailing is one of the types of car service. Detailing is a complex of high-tech works for car care, full restoration in the smallest parts of its marketable appearance. Work is carried out both outside (body, headlights, etc.) and inside (interior), and also applies to the power unit. In the process of work, the elements are cleaned, corrected and restored, and, if necessary, replaced (for example, when trimming the passenger compartment).

For example, using detailing services, you can treat the interior and body with protective compounds, paste over the car with vinyl or protective film, prepare the car for sale, namely using the services of polishing, interior cleaning and elimination of minor flaws.

The demand for detailing among car owners is also increasing, because it is much easier to take care of the car instead of then repairing the damage. This state of affairs testifies to the growing popularity of the industry and its significant potential for further development [1].

If we analyze the Internet statistics for the search query “detailing” in the city of Sevastopol, then only in the last 2 years the number of requests has increased by 1.7 times (Figure 2) [3].

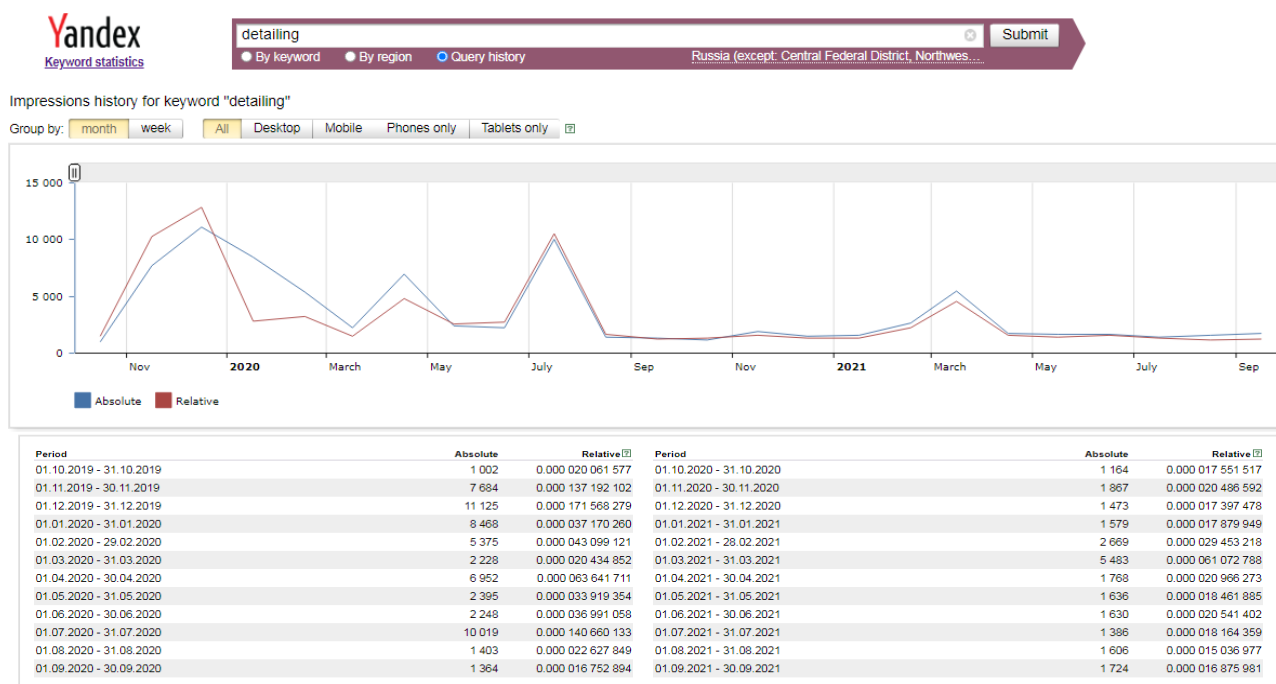


**Figure 2.** Statistics on the search query “detailing” in Sevastopol

This statistics reveals of the growing popularity of the direction and the desire of more and more people to have as much information as possible, which naturally has also increased. With the increase in the possibilities and demand for the Internet, a lot of various channels have appeared through which one can communicate and share knowledge: social networks (including Youtube and Instagram), various instant messengers, mobile applications, etc. – all these resources increase the popularity of car detailing in the infospace.

What forces some consumers to use services outside the territory of Crimea?

Since large and well-known companies in the field of detailing services are outside the territory of Crimea and do not have branches here, it forces some car owners to turn to these companies on the mainland for services. First of all, this is due to the fact that qualified personnel are needed to provide high-quality detailing services, and today it is quite difficult to find such craftsmen. Secondly, this is due to the fact that there are companies on the mainland that do exclusive types of work, which also allows you to stand out from competitors.

The bulk of Sevastopol detailing enterprises perform a typical set of procedures, including dry cleaning of the car interior, polishing, application of liquid glass or anti-gravel film. An expanded range of works involves the restoration of the interior, the hauling of seats, straightening, elimination of defects in glass and paintwork. The sphere strives to ensure that detailers can perform any work related to improving the visual/protective characteristics of equipment, extending its service life and changing the visual perception of transport for the better. This is another key difference between the service provided on the mainland and the service provided in the city of Sevastopol.

Expansion of services and advanced training by training personnel from leading enterprises in the field of detailing will create a high level of service in Sevastopol and stand out from competitors. Thus, the interest among car owners in these services will increase even more due to the quality of the service provided and a wide range of services. This will allow the client to immediately perform a number of works, which in turn will permit the company to increase the average check from the sale of services, as a result of which the volume of services provided will increase thus increasing the profit.

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## **ЭВОЛЮЦИЯ ДИЗЕЛЬНЫХ ДВИГАТЕЛЕЙ И ЗАДАЧИ НА БУДУЩЕЕ**

### **THE OVERVIEW OF DIESEL ENGINES: ITS EVOLUTION AND THE COMING CHALLENGES**

**Аннотация.** В статье представлена справочная информация, касающаяся эволюции дизельных двигателей. Автор фокусируется на изменениях в технологиях дизельных двигателей и анализирует преобразования, которые произошли в дизельных двигателях. Описаны принцип действия и важные атрибуты дизелей. Доказано, что дизельные двигатели превосходят другие типы двигателей благодаря технологическим разработкам, которые способствовали снижению выбросов выхлопных газов. Современные автомобили с дизельным двигателем считаются тихими и экономичными, поэтому перспективы для дизельных двигателей значительны и многообещающие.

**Abstract.** The article provides background information relating to the evolution of diesel engines. It focuses on the changes in diesel engine technologies and analyzes the transformations that have occurred in diesel engines. The operation principle and important attributes of diesels are

described. It is proved that diesel engines surpass other engines types because of technological developments that contributed to improved exhaust emissions. Modern diesel-powered vehicles are considered to be quiet and fuel efficient, and consequently, the prospects for diesel engines are significant and promising.

**Ключевые слова:** дизельный двигатель, работа, оборот, предкамерный двигатель, насос-форсунка.

**Key words:** diesel engine, operation, revolution, pre-chamber engine, pump-injector.

Diesel engines are believed to be the dominant propulsion engine of choice for most of the commercial surface transportation applications in the world. They are fundamentally more efficient thermodynamically than gasoline engines. Since a diesel engine compresses only air, it is not knock-limited like a gasoline engine, so it is possible to operate at much higher compression and expansion ratios, further enhancing thermodynamic efficiency. The difference is profound. Depending on duty cycle, diesel engines deliver 30% or greater reductions in fuel consumption compared to gasoline engines. And for any duty cycle, a diesel engine will always be more efficient than gasoline or other spark ignited engines. This article outlines the history of diesels and presents its future perspectives [1].

The diesel engine is considered to have been invented by Rudolph Diesel (1858–1913), although this is not entirely true. Herbert Ackroyd Stewart, several years earlier than Diesel, assembled and successfully launched another engine, which was later constructively repeated by Diesel, and which is now referred to as diesel. But, unlike the Germans, the British decided that it was too unprofitable to produce a Diesel engine due to the excessive complexity in manufacturing and left the project. The theoretical concept of the diesel engine was developed by Rudolph Diesel in 1890 when he abandoned ammonia engine unfinished. Then he wrote: “Instead of ammonia, one need to take compressed hot air, inject fuel into it and, simultaneously with combustion, expand it so that as much heat as possible can be used for useful work” [2]. His engine concept was to force the air to be compressed to the point where the temperature and pressure inside the cylinder began to rise tremendously. Subsequently, the fuel-air mixture ignited, forcing the piston to move downward, and the need for subsequent ignition disappeared. When Diesel started work on its engine, the efficiency of gasoline models reached only 12%, and gas – 17%. Moreover, even the first prototype of the inventor demonstrated 25% efficiency.

The first working diesel engine was created in 1897. It was a bulky unit weighing 5 tons, occupying an entire production facility. It had very modest power and efficiency characteristics, but it was superior to its counterparts, and most importantly, it implemented the basic principle of diesel engines operation – self-ignition of cheap oil products when mixed with high-pressure air.

Its further development proceeded rapidly, after a couple of decades this type of engine found its place not only in production, but also in transport. They gradually began to be equipped with railway vehicles, ships and cars. The diesel engine began to supplant other, less efficient, steam engines. It competed with its eternal rival, the gasoline engine, to occupy its niche in the field of heavy vehicles, postponing its advance towards small-sized vehicles such as passenger cars. For a long time, the science and technology unpreparedness prevented full realization of diesel operation advantages. As a result, due to the very high pressure (today it is already above 1000 atm) in the fuel system, difficulties in organizing well-coordinated injection into the cylinders, low environmental friendliness, the units turned out to be relatively bulky, and on small mechanisms they noticeably lost to gasoline ones [3].

Diesel was gradually improved while still largely theoretically. Its breakthrough at the end of the twentieth century became a reality with the advent of modern fundamentally new achievements,

mainly in the field of materials technology, electronics and computer technology. Among the main engineering and scientific issues which have become the most important for the subsequent breakthrough of the diesel engine, are the following:

- invention and gradual development of the principle of direct injection into cylinders, instead of the original version with a pre-chamber for the mixture formation;
- the invention of a high-pressure fuel pump and a compressor-free nozzle in the 1920s by Robert Bosch, as independent and the most important components of modern diesel engines;
- invention of the principle of separate creation of high fuel pressure and its subsequent injection into cylinders, implemented later in the most popular common rail systems today;
- gradual advancement of turbocharging technology, which allows to significantly boost the flow rate of the supplied air, thereby increasing power and efficiency;
- gradual improvement of the operation algorithm, ways of implementing the physical principles of diesel and honing technologies.

The first diesel injection systems to appear on production vehicles were pre-chamber engines. In a pre-chamber system used for diesel engines of passenger cars, fuel is injected into a hot pre-chamber or, in other words, an additional chamber. It starts pre-ignition in order to achieve the formation of a good mixture and reduce the ignition delay for the main combustion process. Fuel is injected using a needle nozzle at a relatively low pressure of up to 300 bar. Later engines with vortex antecedents appeared. Its difference is that the combustion process uses an additional combustion chamber in the form of a ball or disk, which is called a vortex chamber.

The most advanced diesel fuel injection system to date is the direct injection system. In such systems, the mixture formation needs no additional vortex chamber. Fuel is injected directly into the combustion chamber above the piston. As in a vortex chamber system, air swirl is generated during the intake and compression strokes. This vortex is caused by a specially shaped intake port in the cylinder head. The piston top design with an integrated combustion chamber promotes air movement at the end of the compression stroke, i.e. at the beginning of injection. The combustion chamber shapes widely used in the diesel engines development today correspond to a cylindrical recess in the piston.

The essential advantage of the direct injection system is the reduction in fuel consumption by up to 20% compared to engines with a split combustion chamber. The disadvantage of engines with a pre-chamber is the high noise level. Insufficient mixture formation, caused not only by the dissipation of heat by the walls of the combustion chamber, leads to a relatively long period of ignition delay and to knocking noise during combustion. When the engine warms up, the vortex engine also tends to be noisier at low load and low revolution ranges.

The operation principle of all existing diesel injection types is identical. The main power elements are a high-pressure fuel pump (injection pump) and a nozzle. The task of the first component is the injection of diesel fuel, due to which the pressure in the system increases significantly. The nozzle also supplies fuel (in a compressed state) to the combustion chambers, while spraying it to ensure better mixing.

It is worth noting that the fuel pressure directly affects the combustion mixture quality. The higher it is, the better diesel fuel burns, providing a greater power output and less pollutants in the exhaust gases. And to obtain higher pressure values, a variety of design solutions were used, which led to the emergence of different types of diesel power systems. Moreover, all the changes concerned exclusively these two elements – fuel injection pump and injectors.

Diesel power plants can be equipped with an injection system with a high-pressure inline pump, distribution pumps, pump injectors, as well as battery type (Common Rail) [4].

The power supply system with in-line injection pump can be considered to be the very first one used on diesel engines. But now it is already obsolete and practically not used. The main feature

of this system is the pump. In it, the plunger elements creating pressure served its own nozzle, the number of which corresponded to the number of nozzles. Moreover, these pairs were placed in a row.

The fuel injection pump of distributed injection has become the next stage in the development of power systems for diesel units. The peculiarity of this type of injection was that the designers refused to use a multi-section pump design. In the fuel pump, only one plunger pair began to be used, servicing all available injectors, the number of which varies from two to six. To ensure the supply of fuel to all injectors, the plunger performs not only translational movements, but also rotational ones ensuring the distribution of fuel.

The pump-injectors can be considered a separate branch in diesel power systems, since they are not used as such in the design of the high-pressure fuel pump. A kind of this injection type is the use of individual pumps. That is, for each injector, its own section is provided, which is driven by the camshaft. The section can be located directly in the cylinder head or be placed in a separate housing. This design uses conventional hydraulic nozzles. Unlike injection with a high-pressure fuel pump, the high-pressure lines are very short, which made it possible to significantly increase the pressure. But this design did not receive much distribution.

The battery system (Common Rail) is still the most advanced in terms of efficiency. Its peculiarity lies in the fact that the versatility of the injection pump is not required. Its task is only to build up pressure, and not for each nozzle separately, but a common line (fuel rail), and already from it diesel fuel is supplied to the nozzles. At the same time, the fuel lines between the pump, rail and injectors have a relatively short length, which made it possible to increase the generated pressure. The control of the work in this system is carried out by an electronic unit, which significantly increased the dosage accuracy and the speed of the system.

Today, there is no longer any doubt that diesel provides power and dynamics that match or even surpass other types of engines. Thanks to the standard variable geometry turbochargers, modern diesel engines deliver high torque even at low revolution [5]. The popular belief that diesel engines are dirt and noisy is in the past. Nowadays, diesel engines power all types of automotive vehicles: passenger cars (up to 50% of new car sales in some European countries); commercial vehicles; buses; industrial, agricultural and construction equipment; mine trucks; locomotives; ships; and many stationary power applications. Modern diesel-powered vehicles are quiet and fuel efficient, and the diesel engine has gone from being a curiosity and workhorse to widespread use. If in 1997 only 22% of cars sold in Western Europe were diesel, today this figure is about 50%. Even with the active development of alternative powertrains, the prospects for diesel engines are still great.

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**ТЕХНОЛОГИЯ СВАРКИ В СУДОСТРОЕНИИ:  
ВИДЫ И СПОСОБЫ ПРИМЕНЕНИЯ  
WELDING TECHNOLOGY IN SHIPBUILDING:  
TYPES AND METHODS**

**Аннотация.** В статье говорится о сварке, разновидностях и способах их применения. Изначально судостроители были в поисках более прогрессивной технологии сварки. С помощью технологии сварки, судостроители достигли качественного вида сборки, который позволил уменьшить вес судна на 15%. В настоящее время кораблестроители добились качественной сборки кораблей с помощью сварочной технологии, которая обеспечивает снижение веса. В рамках новых технологий сварки исследуются и оцениваются преимущества новых технологий для судостроения.

**Abstract.** The article deals with welding technology which is improving with each passing day. Its varieties and methods of application are described. Initially, shipbuilders tried to find more advanced welding technology. Currently shipbuilders have achieved a high-quality type of ship assembly by means of welding technology, which provide ship's weight reduction by 15%. In the scope of new technologies on welding, the benefits of new ones to the shipbuilding are investigated and evaluated.

**Ключевые слова:** судостроение, технологии сварки, дуговая сварка, газокислородный метод, прочность.

**Key words:** shipbuilding, welding technology, arc welding, gas-oxygen method, strength.

Since the beginning of metal application for the ship hulls construction of various purposes, shipbuilders have constantly been searching for a more advanced production technology. The use of metal structures in the manufacture of ship hulls has significantly increased the strength characteristics of ships [5].

“Welding is very important in shipbuilding industry. In order to protect the ship structure, this process should be performed by the qualified welders and controlled efficiently by the quality control engineers and Classification Societies” [7, p. 24]. The use of the traditional riveting method for assembling the load-bearing frame significantly increased the weight of the vessel. In shipbuilding, the common technique is known to be an electrical arc welding which has made it possible to effectively cope with this problem. This technology made it possible to reduce the total weight of the ship by 10-15%.

In addition, welded metal structures in comparison with riveted ones provide a number of undeniable advantages. Due to the use of structural elements with the minimum permissible cross-section and the optimal shape, it becomes possible to significantly reduce the total weight of the structure. Moreover, the use of fewer fasteners and elements of a more rational shape allows to keep metal in the good condition significantly. At the same time, welding in shipbuilding made it possible not only to significantly increase the strength and reliability of all connections, but also to reduce labor and time costs for the construction of ships. This is achieved due to the possibility of mechanization and automation of the welding process. Moreover, the appeal to a clean shipping sector requires an application of the energy-efficient designs using renewable energy technologies [8]. “Ship designing is a process of synthesis bringing together a wide range of disciplines and analysis methods” [5, p. 361]. The purpose of the scientific study is to analyze last welding methods, their advantages and prospects for shipbuilders.

Welding technologies in shipbuilding industry were analyzed by E. Turan, T. Koçal, K.Ünlügençoglu, Christopher McFadden, and others.

They stated that current welding techniques are applied in the construction of numerous items and “these processes differ greatly in the manner in which heat, pressure, or both heat and pressure are applied and in the type of equipment used” [7, p. 24].

Arc welding methods are mainly used in the manufacture of ship hulls. The creation of welded joints of two parts occurs due to the heating of the feed being welded and their melting by the heat released during the burning of an electric arc. The formation of molten metal and good metal fluidity promotes free mixing and the formation of a single whole during subsequent crystallization [4].

A similar mechanism for the formation of permanent unified structure is provided by the types of welding:

- manual electric arc covered with piece electrodes;
- argon arc with a non-melting tungsten electrode in an inert gas environment;
- mig/mag-mechanized welding with a melting electrode in a protective gas environment;
- automatic welding under the flux layer;
- gas welding [3].

In shipbuilding, every technology is used in a different manner (Figure 1). However, the most widespread method is an electric arc welding.

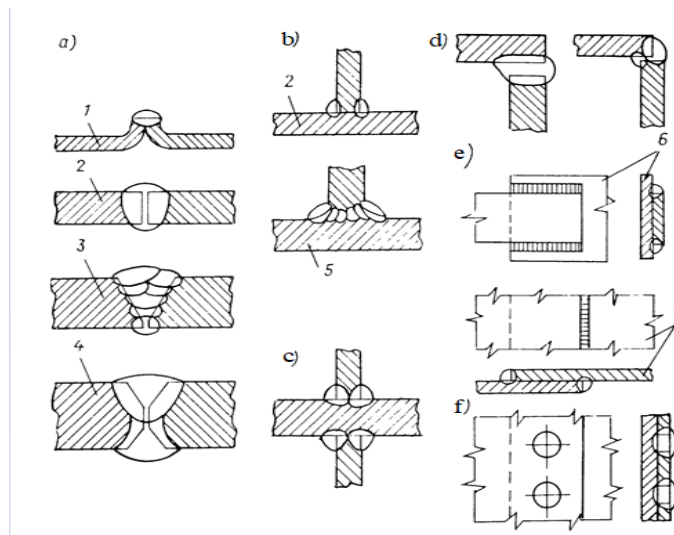


**Figure 1.** Types of welded connections

*a – butt; b – T – shaped; c – cross; d – angular; e – overlapping; f – overlapping with electric rivets. 1 – with edge flanging; 2 – without edge bevel; 3 – with one-sided edge bevel (with U-shaped cutting); 4 – with two-sided edge bevel (X-shaped cutting); 5 – the same (K-shaped cutting); 6 – with flank corner seams; 7 – with end (frontal) corner seams.*

The connection of parts by means of the gas-oxygen method has recently become less and less used. This is mainly due to the low productivity of the process and the probability of structural deformations as a result of welding operations. “Precise measurement of oxygen is critical for processes in many industries, ranging from the purity of industrial gases and protecting against leaks in glove boxes to monitoring flue gas for optimum combustion efficiency” [6]. The requirements of applications are various therefore some experts offer a range of analyzers to ensure the best technology for manufacturing.

Depending on the brand of shipbuilding steel, coated piece electrodes of the main type are used: for welding high-strength steels in all spatial positions and with a thin-layer coating for installing tacks and welding on the descent. When working on a semi-automatic machine, both rutile-type powder wire in a protective CO<sub>2</sub> gas and rutile-type powder wire in an Ar/CO<sub>2</sub> protective gas mixture are used for welding in all spatial positions and on ceramic linings. In addition, high-performance metal-powder wire is used for welding corner seams and filling passages in the lower spatial position in an Ar/CO<sub>2</sub> environment or in 100% CO<sub>2</sub> [1; 2].

The choice of welding materials is a rather important stage of preparation for the welding process. Some recommendations that allow you to make the right choice of welding materials:

- It is necessary to take into account the thickness of the parts that will be welded. The larger this parameter, the larger the diameter of the electrode should be. For welding metal with a thickness of 0.5...1.5 mm, it is better to use TIG welding or a semi-automatic machine [1].

- The welding material directly depends on the type of welding machine used for the welding process.

- The type and grade of the welding material is greatly influenced by the grade of the main metal being welded and the requirements for the deposited metal [2].

Thus, with the developed technology in all areas, welding technology is improving with each passing day. A rather important stage of preparation for the welding process is the choice of welding materials. It is necessary to take into account the type of welding machine, the thickness of the parts and the type of the welding material. Furthermore, in order to protect the ship structure, welding process should be performed by the qualified welders and controlled efficiently by the quality control engineers.

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**ОЦЕНКА ЭФФЕКТИВНОСТИ РАБОТЫ СИСТЕМЫ  
ПАССИВНОГО ОТВОДА ТЕПЛА НА АЭС С ВВЭР-1000  
EVALUATION OF THE OPERATION EFFICIENCY OF THE PASSIVE HEAT  
REMOVAL SYSTEM AT A NUCLEAR POWER PLANT WITH WWER-1000**

**Аннотация.** Статья посвящена вопросам моделирования работы теплообменного оборудования, предназначенного для использования в системах пассивного отвода тепла от оборудования АЭС. Для выполнения расчетов и оптимизации характеристик данных систем была разработана расчетная модель замкнутого двухфазного термосифонного контура, состоящего из испарительного, конденсационного и транспортного участков. Моделирование работы исследуемой системы выполнено при помощи теплогидравлической программы RELAP5/Mod3.4. Граничные условия на внешней поверхности теплообменника-конденсатора, при использовании воздуха в качестве конечного поглотителя, уточнены совместным применением программы MELCOR 1.8.5. На основании выполненных расчетов получены зависимости отводимой мощности от разности температур, геометрических характеристик системы пассивного отвода теплоты и степени заполнения испарителя.

**Abstract.** The article deals with issues of modeling the operation of heat exchange equipment intended for use in passive heat removal systems from nuclear power plant equipment. To perform calculations and to optimize the characteristics of these systems a computational model of a closed two-phase thermosiphon circuit consisting of evaporative, condensation and transport sections was developed. The simulation of the system operation was performed using the thermohydraulic program RELAP5/Mod3.4. The boundary conditions on the outer surface of the heat exchanger-condenser, when using air as the final absorber, are clarified by the joint application of the MELCOR 1.8.5 program. On the basis of the calculations performed, the dependences of the output power on the temperature difference, the geometric characteristics of the system and the degree of filling of the passive heat removal system evaporator are obtained.

**Ключевые слова:** система пассивного отвода тепла, бассейн выдержки, двухфазный термосифон, теплогидравлическая программа RELAP5/Mod3.4, водо-водяной энергетический реактор.

**Key words:** passive heat removal system, spent fuel pool, two-phase thermosiphon, thermohydraulic program RELAP5/Mod3.4, water-water energetic reactor.

As experience of nuclear power plants operation has shown, the loss of heat removal from a spent nuclear fuel pool can lead to a severe accident causing fuel element damage and release of radionuclides into the environment. A typical example of such accident is the 4<sup>th</sup> unit of the Japanese Fukushima Daiichi nuclear power plant in March, 2011.

Means to prevent damage of spent nuclear fuel in a spent fuel pool because of prolonged blackout are not always fully provided for operating nuclear power plants with WWER-1000 (and

similar in power PWR reactors), as well as in modern projects of reactor plants with WWER. Therefore, the most pressing task is the development of a passive residual heat removal system (PRHRS) of spent nuclear fuel in a spent fuel pool.

PRHRS of spent nuclear fuel pool (SNFP) is a closed circuit with natural circulation of a two-phase coolant. The structure of the PRHRS includes evaporative, condensing and transport sections [2, p. 183]. The functioning of the PRHRS is based on the principle of operation of a ring-shaped two-phase thermosiphon (TTS), the evaporator of which is located in the pool, and the condenser is outside the containment building. The evaporator and the condenser of the ring-shaped TTS are connected by steam and condensate transmission pipelines. The coolant of the ring-shaped TTS is water (Figure 1).

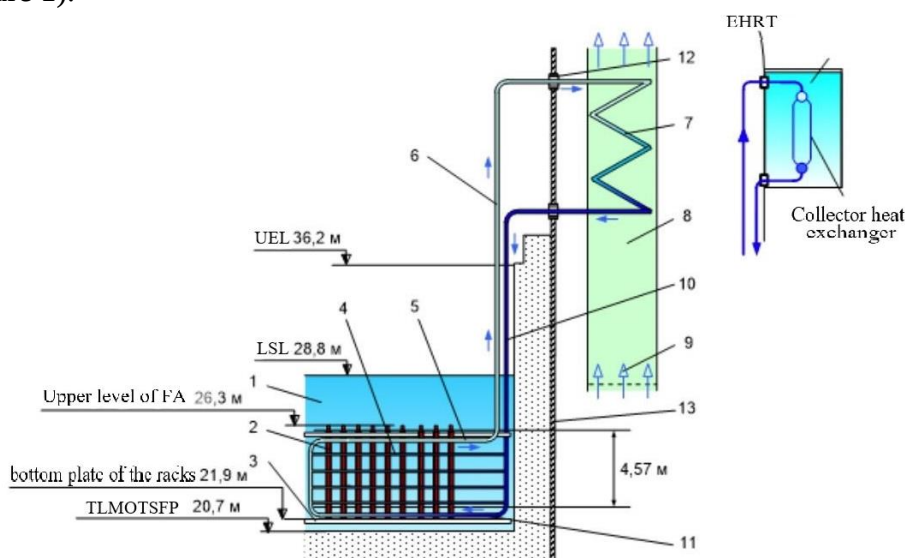


**Figure 1.** The scheme of an autonomous passive residual heat removal system of spent nuclear fuel pool based on a ring-shaped two-phase thermosiphon

The decay process of radioisotopes, which emit heat in spent fuel assemblies, is removed by  $H_2O$  of the spent fuel pool. Heat from water of the spent fuel pool is transferred to the outer surface of the evaporators of the ring-shaped TTS (4), and then to the intermediate coolant of the ring-shaped TTS.

Due to external heat supply an intermediate coolant of TTS is vaporized, its steam through a pressure manifold (5) enters steam pipeline (6), which is taken outside of reactor compartment containment (13) via containment penetration (12) and connected to the condenser of the ring-shaped TTS (7).

Steam is condensed in the condenser when cooled by atmospheric air flow (9). Then condensate from the condenser (7) due to the gravitational forces is returned to the evaporator of the TTS (4) via condensate pipe (10) and distributing manifold (11).

The evaporator of the ring-shaped TTS, the heat exchange surface of which is formed of pipes or flat plates, is located in a gap between the side wall of the spent fuel pool and hexagonal covers of spent fuel assemblies racks. The evaporator practically does not take away the useful volume of the pool compartments, and therefore does not affect the number of spent fuel assemblies placed in it.

Water or a low freezing liquid can be used as an intermediate coolant of the TTS. Using the latter would make it possible to exclude freezing of PRHRS intermediate coolant in the condenser at low ambient temperatures [1, p. 374].

Heat removal to water placed in emergency heat removal tank (EHRT) can also be used along with the heat removal from the spent nuclear fuel pool to atmosphere. In doing so, heat in the EHRT resolves the problem of freezing of the intermediate coolant of the TTS. At the same time, the PHRS of the spent fuel pool will be able to operate effectively only until water in the EHRT heats up significantly (not higher than up to  $+70^{\circ}C$ , if based on requirement that the water temperature in the spent fuel pool should not exceed  $+90^{\circ}C$ ) [0, p. 5]. Therefore, the option of an air heat exchanger-

condenser for the PRHS of the spent fuel pool is preferable, and it is the only possible variant in conditions of prolonged blackout of a plant.

The ring-shaped TTS is put under vacuum to remove non-condensable gases before filling with intermediate coolant. The pressure in the circuit of the PRHS of the spent fuel pool is determined by saturation vapor pressure at temperature of less than  $+100^{\circ}\text{C}$  and remains at a level lower than atmospheric pressure. Therefore, there will be no release of radionuclides into the atmosphere in case of leaks in the circuit of the PRHS of the spent fuel pool, as well as no pure condensate could run into the spent fuel pool, that excludes possibility of reactivity accidents.

The PRHS of the spent fuel pool is built with a lot of channels with the main elements' redundancy within a channel. If a leak is detected under normal conditions of operation (for example, due to vacuum decay in the circuit of the TTS), personnel has an opportunity to identify and localize the damaged heat exchange section. Since the heat exchange surface is chosen to be excessive in relation to the maximum possible heat load on each compartment of the spent fuel pool, the system will continue to remove heat to the extent necessary.

Figure 2 shows evaporators layout of the PRHS of the spent fuel pool of the reactor building of a NPP with WWER-1000/V-320.

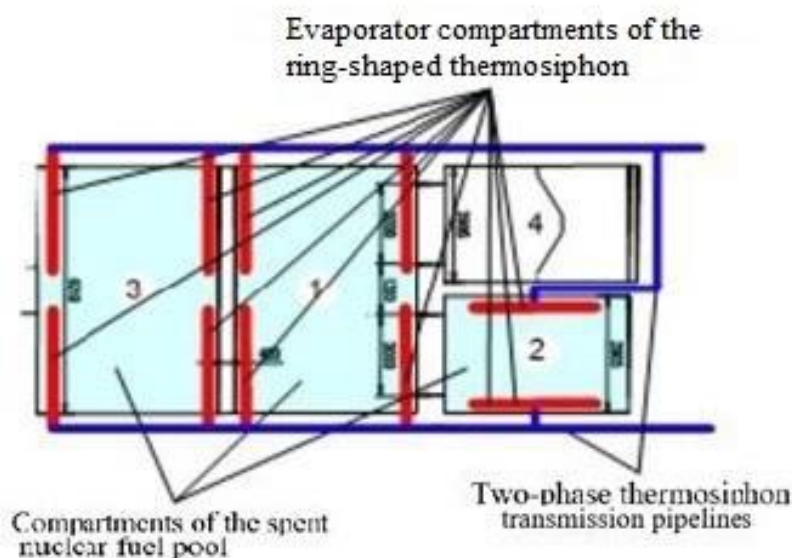


**Figure 2.** PRHS elements layout in the compartments of the spent fuel pool of the reactor building of a NPP with WWER-1000/V-320

It is proposed to use two of six containment penetrations Dy 1600 mm of the reactor building ventilation system to take transmission pipelines outside the containment building in existing reactor installations with WWER-1000/V-320. Additional containment penetrations therefore should be included in the design of modern reactor installations with WWER to take transmission pipelines outside of the ring-shaped TTS.

Thus, we considered the use of an evaporator made of flat plates. A boiling section measuring  $2500 \times 2500 \times 200$  mm and consisting of 251 vertical parallel plates with channels is formed. The heat exchange section is located in the gap between the wall of the spent fuel pool and a rack for storing spent nuclear fuel. The water of the spent fuel pool moves from top to bottom in the gaps between the plates. The results of calculation the characteristics of the section of the PRHS are shown in Figure 3, where the temperature of the heating medium is  $90^{\circ}\text{C}$ , the temperature of the final absorber is  $60^{\circ}\text{C}$ .

Calculations of the operation of the PRHS of the spent nuclear fuel pool were performed with the help of programs RELAP5/SCDAP/Mod3.x and MELCOR 1.8.5. (SCDAP / RELAP5 / MOD3.2 Code Manual. NUREG/CR-6119, Vol. 1, Rev. 2. SAND2000-2417/1. MELCOR Computer Code Manuals. Vol. 1: Primer and Users' Guide. Version 1.8.5 May 2000/ NUREG/CR-6119, Vol. 2, Rev. 2. SAND2000-2417/2. MELCOR Computer Code Manuals. Vol. 2: Reference Manuals.

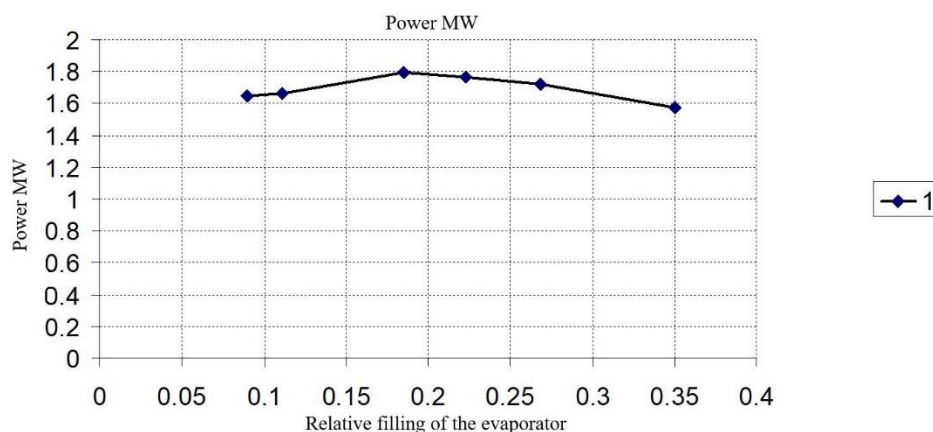


**Figure 3.** Transmitted power per one heat exchange section of the plate evaporator

Calculations show that the maximum heat load to the compartment of the spent nuclear fuel pool with emergency core unloading is  $\sim 8.5$  MW at a maximum air temperature of  $+40^{\circ}\text{C}$ . Steady temperature of borated water in the spent fuel pool remains obviously below  $+90^{\circ}\text{C}$  even under the worst conditions. In other words, boiling and loss of water from the spent nuclear fuel pool are excluded. This, in turn, provides reliable heat removal from the spent fuel pool just long enough to recover operation of standard heat removal systems and to add water to the spent fuel pool. Thus, the possibility of severe accidents is completely excluded at power units, where the proposed passive heat removal systems are used.

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**ИССЛЕДОВАНИЕ ГЕНЕРАТОРА, УПРАВЛЯЕМОГО НАПРЯЖЕНИЕМ ДЛЯ  
РАЗРАБОТКИ СИСТЕМЫ ГОЛОСОВОЙ СВЯЗИ ПО ЭЛЕКТРОСЕТИ 220В, 50Гц  
RESEARCH OF VOLTAGE CONTROLLED GENERATOR FOR DEVELOPMENT OF  
VOICE COMMUNICATION SYSTEM ON ELECTRIC MAINS 220V, 50Hz**

**Аннотация.** В данной статье рассматривается исследование, направленное на изучение генератора, управляемого напряжением, с целью разработки системы передачи голосовой связи по электросети 220В, 50 Гц. Данное исследование может быть использовано для последующих научных работ или применено как основа будущего проекта.

**Abstract.** This article examines a study aimed at studying a voltage generator, with the development of a voice transmission system for a 220V, 50 Hz power grid. This research can be used for research or applied as the basis for a future project.

**Ключевые слова:** модуляция, электромонтажные работы, высокочастотный сигнал, спектр низкочастотного управляющего сигнала, осциллограмма, подстроечный резистор, фторопласт.

**Key words:** modulation, electrical work, high-frequency signal, spectrum of low-frequency control signal, oscillogram, trimmer, fluoroplastic.

Der Einsatz eines 220 V, 50 Hz Netzes zur Datenübertragung zwischen zwei oder mehreren Geräten ist seit langem Gegenstand des Interesses von Entwicklern [2]. Vor etwa dreißig Jahren war die Idee, ein Hausstromnetz zum Aufbau der Kommunikation zu nutzen, nicht ernst anzunehmen. Die Datenübertragung über das Hochspannungsnetz hat derzeit sehr gute Chancen für kommerziellen Erfolg. Der unbestreitbare Vorteil der Hochspannungskommunikation zur Informationsübertragung besteht darin, dass keine Kabel- und Elektroarbeiten durchgeführt werden müssen. Die Komplexität beim Aufbau solcher Netze liegt darin, dass es keine einheitlichen Standards gibt, die Netze sehr laut sind, ihre Parameter sich bei Lastwechsel stark ändern.

Bei der Datenübertragung über ein 220-V-50-Hz-Netz klingt das Hochfrequenzsignal schnell ab. Die gleichzeitige Funktionsfähigkeit technischer Mittel muss bei unbeabsichtigter elektromagnetischer Beeinflussung ohne unzulässige elektromagnetische Beeinflussung anderer technischer Mittel und dementsprechend die Trennung der Datenübertragung vom Stromverbrauch gewährleistet sein.

Das Ziel dieser Arbeit ist die Untersuchung eines spannungsgesteuerten Generators als Mittel zur Entwicklung eines Sprachkommunikationsübertragungssystems über ein 220 V, 50 Hz Stromnetz. Die Methoden der Sprachmodulation und die Modulationsarten müssen auch betrachtet werden.

Die Arbeit eines Unternehmens ist ohne die Kommunikation zwischen seinen Abteilungen unmöglich. Nehmen wir an, Sie brauchen eine sofortige Entscheidung, um ein Problem zu lösen, aber

es gibt keine Zeit, auf den Kurier zu warten, und das Objekt von Interesse befindet sich im Keller, wo es keine Telefonkabel gibt. Man muss auch das berücksichtigen, dass nicht jedes Unternehmen die Nutzung von Telefon- und Funkverkehr erlaubt. Solche Unternehmen können sowohl geschlossene militärische oder wissenschaftliche Forschungseinrichtungen, als auch Objekte mit erhöhter Geheimhaltung sein.

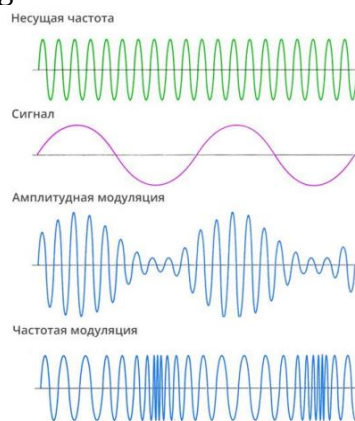
Mit dem Auf- und Umbau von Unternehmen gibt es das Problem der Verlegung neuer Kommunikationsleitungen. Auch an schwer zugänglichen Stellen ist eine Kommunikation notwendig. Beim Bau der Gebäude wird zunächst ein Elektrifizierungskonzept entwickelt. Daher ist es empfehlenswert, diese Verkabelung für

die Kommunikation zwischen den Räumen zu verwenden. Dies ist die Relevanz der entwickelten Lösung.

Modulation [1] ist der Prozess des Modifizierens eines oder mehrerer Parameter eines modulierten Trägersignals bei der Verwendung eines Modulationssignals. Die übertragenen Informationen werden in das Modulationssignal eingebettet, und die Rolle des Informationsträgers wird von einer hochfrequenten Schwingung übernommen, die als Träger bezeichnet wird. Modulation ist der Vorgang des "Landens" einer Informationswellenform auf einem bekannten Träger, um ein neues moduliertes Signal zu erhalten.

Durch die Modulation wird das Spektrum des niederfrequenten Steuersignals in den hochfrequenten Bereich übertragen. Dies ermöglicht es bei der Organisation des Rundfunks, die Funktion aller Empfangs- und Sendegeräte auf unterschiedlichen Frequenzen so anzupassen, dass sie sich nicht gegenseitig "stören".

Als Träger können Schwingungen verschiedener Formen verwendet werden, am häufigsten werden jedoch harmonische Schwingungen verwendet. Je nachdem, welcher der Parameter der Trägerschwingung sich ändert, werden die Modulationsarten (Amplitude, Frequenz, Phase etc.) unterschieden. Die Modulation wird durchgeführt, um Informationen durch elektromagnetische Strahlung zu übertragen. Die übertragenen Daten sind im Steuersignal enthalten. In der Rolle der Trägerschwingung können Schwingungen verschiedener Formen verwendet werden, deren Diagramme in der Abbildung 1 dargestellt sind.



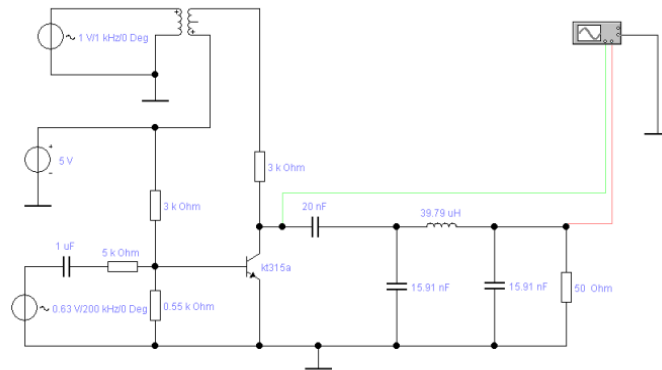
**Reis. 1.** Modulationsarten

Simulations- und Referenzsignale werden an den Eingang [6] des Modulationsgerätes übertragen, dadurch liegt am Ausgang ein moduliertes Signal an. Als Bedingung für eine korrekte Umsetzung wird eine Verdoppelung der Trägerfrequenz im Vergleich zum Maximalwert des Basisbandsignals angesehen. Diese Art der Modulation ist recht einfach zu implementieren, weist jedoch eine geringe Störfestigkeit auf.

Stellt sich heraus, dass die Signalamplitude  $U(t)$  veränderlich ist und die verbleibenden beiden Parameter  $\mu$  und  $\varphi$  unverändert sind, dann liegt eine Amplitudenmodulation der Trägerschwingung vor. Die Form der Aufzeichnung eines amplitudenmodulierten oder AM-Signals ist wie folgt:

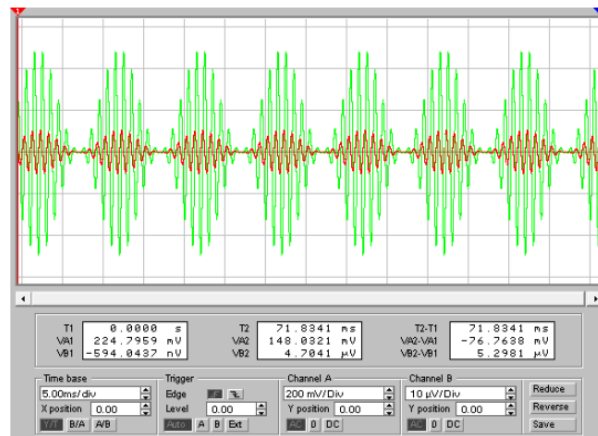
$$UAM(t) = U \cos(\omega_0 + \varphi_0) \quad (1)$$

Gemäß Formel (1) ist das AM-Signal die Ableitung der  $U(t)$ -Hüllkurve und der harmonischen Füllung. Während der Forschung wurde die Schaltung in der EWB-Umgebung getestet, [5] die in der Abbildung 2 gezeigt ist.



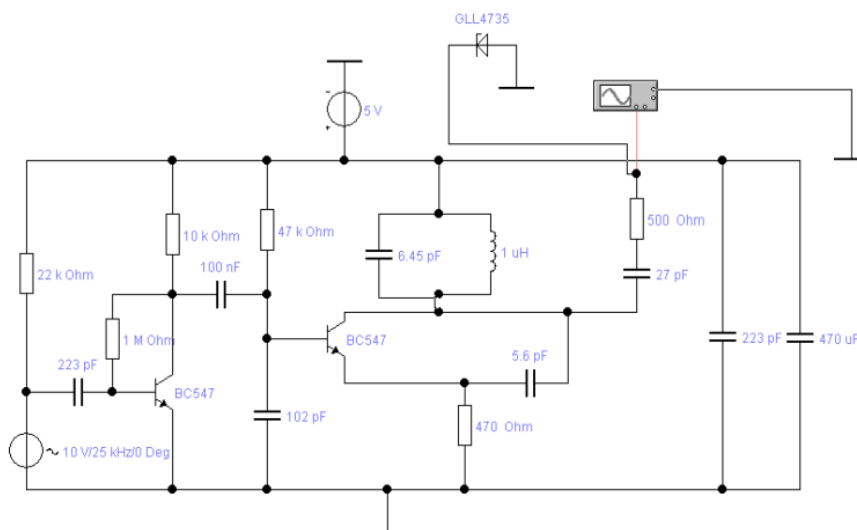
**Reis. 2.** Diagramm der Untersuchung der Amplitudenmodulation.

Als Ergebnis wurde ein Oszillogramm erhalten, das in der Abbildung 3 dargestellt ist.



**Reis. 3.** Oszillogramm des AM-Signals.

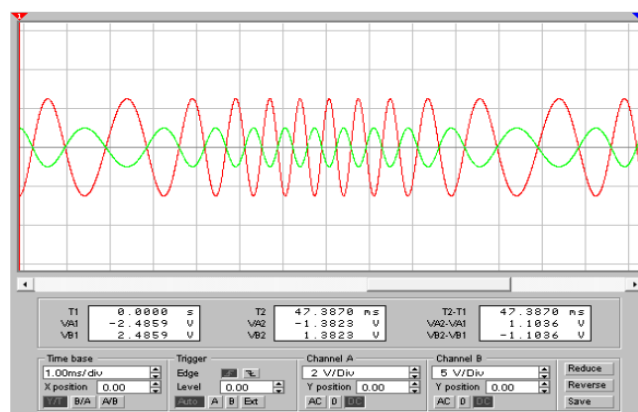
Frequenzmodulation. Das Bild 4 zeigt ein schematisches Diagramm einer Frequenzmodulationsstudie in einer EWB-Umgebung.



**Reis. 4.** Schema der Untersuchung der Frequenzmodulation.

Als Ergebnis wurde ein Oszillogramm erhalten, das in der Abbildung 5 dargestellt ist.

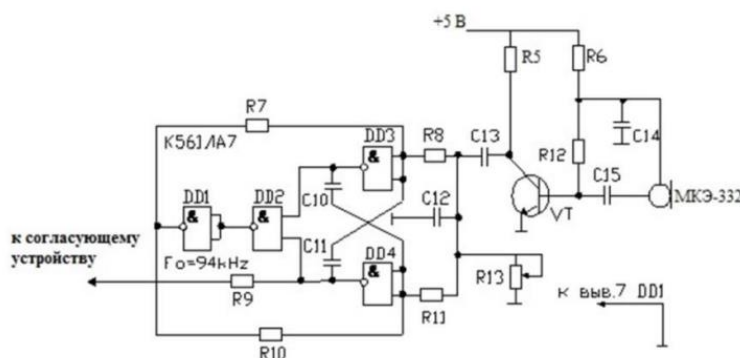




**Reis. 5.** Oszillogramm des FM-Signals.

Durch diese Art der Modulation [1] moduliert das Signal nicht die Leistung, sondern die Frequenz des Referenzsignals. Wenn daher die Größe des Signals zunimmt, dann erhöht sich dementsprechend die Frequenz. Eine solche Modulation zeichnet sich durch eine hohe Störfestigkeit aus, für ihre Anwendung ist es jedoch erforderlich, den Hochfrequenzbereich zu nutzen.

Spannungsgesteuerter Generator. VCO [2] ist ein Hochfrequenzgenerator [2], dessen Frequenz durch das Signal des Mikrofonverstärkers moduliert und das bereits modulierte Signal über den Adapter ins Netz eingespeist wird. Der VCO erzeugt abhängig von der Eingangsspannung eine Trägerfrequenz. In dieser Arbeit wird eine Frequenz genommen, die kein Vielfaches von 50 Hz des Netzes ist, und aufgrund dieser Überlegungen werden 94 kHz als Träger verwendet. Die Abbildung 6 zeigt das VCO-Diagramm.



**Reis. 6.** VCO.

Der spannungsgesteuerte Generator basiert auf einer K561LA7 MOS-Mikroschaltung [3], die 4 “2I-NOT“-Elemente enthält und mit einer Spannung von 3 ... 15 V versorgt wird.

Betrieb der VCO-Schaltung. Das niederfrequente Wechselspannungssignal des Mikrofons wird über eine Kaskade an einem Transistor VT [4] verstärkt und einem spannungsgesteuerten Rechteckgenerator bei DD1 zugeführt, im Takt der Änderung der Eingangsspannung, der Frequenz von dem Ausgangssignal ändert sich. Darüber hinaus befindet sich VT2 im Ausgangszustand in der Mittelstellung, die der Hälfte der Versorgungsspannung entspricht. Die Anfangsfrequenz des Generators wird in Abwesenheit eines Signals vom Mikrofon auf 94 kHz eingestellt, indem der Trimmwiderstand R13 verwendet wird.

Durch die Widerstände R12 und R6 wird der Transistor in den Klasse-A-Betrieb geschaltet, aber bevor das Mikrofon funktioniert, beeinflusst er die Anfangsfrequenz  $f_0$  des Generators nicht. Beim Betrieb des Mikrofons ändert sich die Basisspannung gegenüber dem Ausgangswert, was eine Änderung der Frequenz des Oszillators bewirkt. Beim Experiment wurde festgestellt, dass mit steigendem Widerstand des Potentiometers die Frequenz des AG abnimmt und umgekehrt. Dies liegt daran, dass über den Widerstand R8 von 56 kOhm und das Potentiometer R13 die Ladungsentladung des Rückkopplungskondensators erfolgt. Das Ausgangssignal des VCO treibt den Transistor an, der



direkt mit dem Anpassgerät verbunden ist und am Ausgang des Generators steht. Die Ladungsgleichung wird ausgedrückt als:

$$U_c = E n (1 - e^{-t/RC}) \quad (2)$$

Nach der Formel (2): Je mehr  $\tau = RC$  desto länger lädt sich der Kondensator auf  $U_c = E_p$  auf und desto niedriger ist die AG-Frequenz. Das allgemeine Schema des FM-Senders ist in der Abbildung 4 dargestellt.

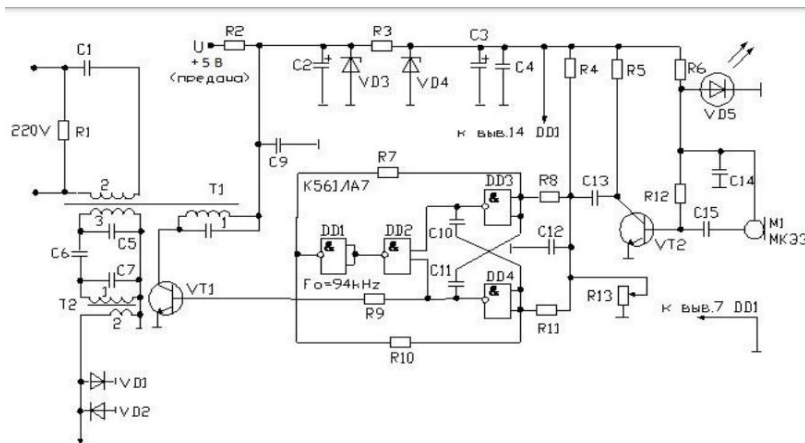


**Abb. 7.** Allgemeines Diagramm des FM-Senders

Beschreibung der Funktionsweise des Gerätekreises. Zur Übertragung [6] werden Frequenzmodulation und eine Trägerfrequenz von 94 kHz verwendet. Das Gerät wird über das Stromnetz mit Strom versorgt. Der Überschuss wird durch einen Kondensator gelöscht und die Unterspannung wird durch eine Diodenbrücke gleichgerichtet. Dann wird es gefiltert und durch eine Zener-Diode [4] KC520 begrenzt und verwendet, um die Ausgangsstufe bei VT1 zu versorgen. Die Spannung von der KS210 Zener-Diode wird verwendet, um den Rest des Gerätes zu versorgen. Das niederfrequente Signal des Mikrofons wird an VT2 in einer Kaskade verstärkt und an DD1 (FM-Modulator) einem spannungsgesteuerten Rechteckgenerator zugeführt. Die Anfangsfrequenz des Generators wird in Abwesenheit eines Signals vom Mikrofon auf 94 kHz eingestellt, indem der Trimmwiderstand R13 verwendet wird. Außerdem wird das Signal des Generators bei VT1 der Endstufe zugeführt. Der Kollektorkreis enthält einen Transformator [4], dessen Primärwicklung auf die Trägerfrequenz abgestimmt ist. Der Transformator Kern und die Wicklungen sind mit Fluorkunststoff isoliert.

Der Abgleich erfolgt über ein Netzteil im +5V-Bereich, verbunden mit einem Plus an Punkt A im Diagramm. Nach dem Kurzschließen der VT2-Basis wird die Oszillatorfrequenz mit einem Trimmwiderstand auf 94 kHz eingestellt. Die Endstufe wird durch Auswahl eines Kondensators im Kollektorkreis abgestimmt, um die Verzerrung der Sinuskurve zu minimieren oder, wenn kein Oszilloskop vorhanden ist, das Signal an der Sekundärwicklung des Transformators zu maximieren. Das Signal zum Mischer wird durch einen Doppelschleifen-Bandpassfilter mit einer Frequenz von 94 kHz geleitet, der auf Ringen mit Daten ähnlich dem Sendertransformator hergestellt wird.

Schlussfolgerungen. Die Ergebnisse der Studie, deren Ziel es war, einen geregelten Spannungsgenerator als Mittel zur Entwicklung eines Systems zur Übertragung von Sprachkommunikation über das 220-V-Stromnetz zu untersuchen, werden berücksichtigt. Im Rahmen dieser Studie wurden die Methoden der Sprachmodulation, Modulationsarten, VCOs, Frequenzsenderschaltungen und ihre Funktionsweise untersucht. In der Zukunft wird diese Forschung eine Grundlage für die Erstellung einer Studie über ein 220-V-50-Hz-Sprachkommunikationssystem sein.

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## **РАЗРАБОТКА СУДНА ПИОНЕР-М DEVELOPMENT OF PIONEER-M VESSEL**

**Аннотация.** В статье рассмотрен процесс строительства научно-исследовательского судна «Пионер-М», а также его навигационные способности. Основной акцент сделан на особенности использования технологии углеродного волокна, с помощью которой сконструирован корпус судна, что гарантирует его резистентность коррозии. Автор подчеркивает автономность судна, способного двигаться без экипажа. Отмечено, что «Пионер» («первый»), «М» («морской») является первым судном в России, проект которого был разработан студентами вузов. В ходе исследования автор раскрывает важность проектов

такого плана, отмечая, что поддержка талантливых молодых ученых является приоритетной задачей науки, а сама конструкция корабля – наглядный пример сотрудничества высшего образования, науки и промышленности.

**Abstract.** The article deals with the construction process of the research vessel “Pioneer-M”, as well as its navigational features. The main emphasis was on the peculiarities of a carbon fiber technology application, by means of which the ship's hull is constructed. It provides hull's resistance to corrosion. The author emphasizes a vessel's autonomy capable of moving without a crew. It is stated that “Pioneer” as “the first”, and “M” as “marine” is considered to be the first ship in Russia which project was developed by university students. In the course of the study, the author reveals the importance of such projects, specifying the support of talented young scientists as a priority task of science. The ship design is a descriptive demonstrative example of cooperation between higher education, science and industry.

**Ключевые слова:** инновационное судостроение, Пионер-М, безэкипажное судовождение, Средне-Невский судостроительный завод.

**Key words:** innovative shipbuilding, Pioneer-M, unmanned navigation, Sredne-Nevisky shipyard.

Unmanned vessels are believed to reduce the cost of transportation and the environment pollution of rivers and seas. In Russia, the scientists have been interested in their development for several years. Since 2016, the government has prepared a draft on the trial operation of autonomous vessels. As part of this experiment, Rosmorport has already started testing equipment that provides ships without a crew. They are carried out on the “Redut” and the “Rabochaya” dredger [1]. The project is being implemented with the support of the Ministry of Education and Science, the United Shipbuilding Corporation and the Agency for Strategic Initiatives at the expense of the “Federal Target Program for Research and Development in Priority Areas of Development of the Scientific and Technological Complex of Russia for 2014” [5]. “The 2014–2020 Program is aimed at achieving the strategic aim of the state policy in the area of science and technology, as formulated in the Foundations of the Policy of the Russian Federation in the Area of Science and Technology for the Period until 2020 and Beyond. The aim is to ensure by the year 2020 a world-class level of research and development and global competitiveness of the Russian Federation in areas determined by the national scientific and technological priorities” [5].

The innovative research vessel “Pioneer-M” with technology of unmanned navigation was launched at the Sredne-Nevisky shipyard on September 24, 2021 (part of the United Shipbuilding Corporation (Picture 1). JSC “Sredne-Nevisky Shipyard” “is one of the leading shipbuilders in Russia specializing in the construction of fiberglass warships and vessels of the next generation. Sredne-Nevisky Shipyard renders a full range of services in construction of ships and vessels of low-magnetic steel, aluminum and fiberglass: from documentation preparation to delivery of a warship or vessel” [2].



**Picture 1.** Vessel “Pioneer-M” launching

The Pioneer-M project was approved by Russian President Vladimir Putin at an expanded meeting of the expert council of the Agency for Strategic Initiatives.

“Pioneer” means “the first”, and “M” means “marine”. This is the first ship in Russia; the project was developed by university students. Students of Shipbuilding department from Sevastopol state university worked on its design in collaboration with colleagues from St. Petersburg, Kaliningrad, Arkhangelsk, Nizhny Novgorod, Kazan and Vladivostok [3].

The purpose of the scientific study is to describe “Pioneer-M” vessel construction.

Pioneer-M “is a challenge, opportunity, within the framework of the emerging world-class scientific and educational center, to create an innovation center focused on innovative shipbuilding, on the development of the world's ocean resources, marine research and technology. A unique cooperation has developed between the universities, USC, ASI due to this project.

A catamaran-type vessel with a hull is designed for a wide range of complex research works in coastal areas, including oceanographic, hydrobiological, hydrochemical, geomorphological, hydroacoustic and diving [4].

Autonomous vessels capable of moving without a crew are also being developed in other countries. So, in September 2021, Norway announced that at the end of the year, the world's first unmanned cargo ship Yara International, powered by electric motors, will be launched. The experiment of the first full-fledged unmanned passage from one port in Norway to another will be carried out under the supervision of engineers present on the ship.

The design of “Pioneer-M” was carried out at Sevastopol State University in the department created by the Central Design Bureau “Coral”, and the plants of the United Shipbuilding Company are engaged in its construction. The length of the vessel is 25.7 m, width – 9 m, speed – 10 knots, displacement – 82 tons.

One should consider the stages of the project implementation “Pioneer-M” was supposed to be able to conduct research with the participation of unmanned aerial and underwater vehicles, as well as an unmanned control system. Sweeping solar panels provide the operation of the hybrid power plant. Then there was a stage of more detailed design and implementation of the students’ concept in metal and plastic. There were requirements of supervisory authorities, the capabilities of shipyards and the availability of component equipment. The work was planned to be deployed at three plants. The Sredne-Nevisky Shipbuilding Plant (SNSZ) in St. Petersburg is to produce the hull of the vessel. The Crimean composite plant was chosen to create the superstructure. The final assembly of the vessel should take place at the Sevastopol Marine Plant [3].

The hull of the vessel was made of carbon fiber, which is not subject to corrosion. The hull has a three-layer structure with a minimum number of set beams. It consists of outer bearing layers made of polymer composite material and a middle filler layer, which is used as foam.

To protect the underwater part from the effects of seawater and fouling, an epoxy protective coating is provided, followed by the application of antifouling paint with increased service life. To protect the freeboard and superstructure from atmospheric influences, as well as to give an appearance, painting with atmospheric epoxy paint materials with a finish coating with acrylic polyurethane enamel is provided.

The system of unmanned navigation has been preserved. The area of solar panels has been reduced to a minimum. The area and visibility of the cabin have increased. A new crane has appeared in the aft part. The carbon fiber body has received a new shape. The production of this vessel has long been mastered at the SNSZ, so it is not surprising that shipbuilders offered this option, and it was approved by the customer. The vessel is believed to be used for testing remote control technologies.

The launching of “Pioneer-M” research vessel is a landmark event in the Year of Science and Technology [2]. This is a unique ship with unmanned navigation technology. Its project was developed by students from seven universities in the country. Supporting talented young scientists is a priority task of science. The ship's design itself is a clear example of cooperation between higher education, science and industry. It is planned that “Pioneer-M” will receive navigation technologies without crew participation. For this, it will have an integrated control system and interaction with marine mobile research laboratories.

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## **ОСОБЕННОСТИ ПРОИЗВОДСТВО БУМАЖНЫХ СТАКАНОВ ДЛЯ ГОРЯЧИХ НАПИТКОВ THE FEATURES OF THE PRODUCTION OF HOT DRINKS CUPS**

**Аннотация.** Статья речь идет о производстве бумажных стаканчиков, которые подразделяются на стаканчики для как холодных, так и горячих напитков. Они изготовлены из крафт-бумаги, высокопрочного оберточного материала, который отличается прочностью и износостойкостью. Сообщается, что технология их производства проста и полностью

автоматизирована. Следует отметить, что бумажные стаканчики служат отличным источником рекламы. Они экологически чистые и легко перерабатываются. Кроме того, производство бумажных стаканчиков в нашей стране является очень перспективным и прибыльным делом.

**Abstract.** The article is concerned with the production of paper cups which are subdivided into cold drink and hot drink ones. They are made up of Kraft paper, a high-strength wrapping material that is durable and wear-resistant. It is reported that the technology of their production is simple and fully automated. It should be mentioned that paper cups serve as an excellent source for advertising. They are environmentally friendly and easily recycled. Additionally, the paper cup manufacturing business is very promising and profitable in our country.

**Ключевые слова:** бумажный стакан, горячий напиток, производство, упаковка, окружающая среда.

**Key words:** paper cup, hot drink, production, packaging, environment.

Production of paper cups is a promising activity that does not require large initial investments, as well as special knowledge and experience. After all, disposable tableware has always been in demand, and not only in large cities, but also in small communities. It is worth noting that plastic products are gradually giving way to paper products. This is due to the fact that the raw material for the manufacture of plastic tableware is not so harmless. Paper is also environmentally friendly product that can fully decompose within three years. In Russia, paper products are practically not made. At this point there are no more than 20 companies that produce such dishes. They are located in the Urals, as well as in the central part of the country. Most of them are engaged in the production of coffee cups [1].

Typically, paper packaging is a product of Kraft paper. This is a high-strength wrapping material, produced from wood by a special method – sulfate cooking. It serves as an excellent product material that should be quite durable and wear-resistant – corrugated cardboard, various bags, Kraft bags and envelopes.

Paper cups are divided into “cold drink cups” and “hot drink cups”. Both of them have different requirements for paper cup materials due to their various uses and processing forms.

To begin with, let's consider the technology of paper cups production. In their production a special strong paper with single or double-sided lamination is used as a fabric, the density varies from 120 to 350 g/m<sup>2</sup>. Single-sided lamination is used in the production of like hot drinks, and for cold drinks double-sided lamination is used.

The technology of production of paper utensils is simple and fully automated. It involves several steps:

- 1) The image is printed on sheets of laminated cardboard.
  - 2) The blanks for the future walls and bottoms of products are cut on the machine.
  - 3) To prevent the cardboard from creasing, it is sprinkled with water. Next, on the next machine, the wet blanks are rolled into a tube and glued. To do this, the side edges are heated to 200°C. At this point the polyethylene film melts and glues the walls of the glass, the same way the bottom is fixed. Sometimes, to glue the laminated paper, sound waves with high frequency are used.
  - 4) The formation of the cup neck is done by impregnating the edge of the blank with silicone, and then rolled.
  - 5) Ready cups are stacked in piles of 80 pieces, and packed in cellophane and boxes [2].
- By design features cups are divided into:
- simple cups made of thick paper with one-sided polyethylene lamination;
  - protected cups made of double-sided coated paper;
  - double-wall and embossed cups for hot drinks;

– double-wall cups with an insulating interlayer perfectly retaining the beverage temperature.

Thus, it can be said that paper cups are light in weight and free from breakage compared with glass bottles. They are of low cost, light quality and saving circulation cost. They can be compounded with a variety of materials to improve the protection function. It is combined with aluminium foil, plastic and other materials to prevent deterioration and deterioration of the contents. The utility model has the advantages of good light shielding performance, good retention of the colour, aroma and taste of the inner packing. Paper cups are easy to open and easy to recover.

In addition, any cup can be equipped with a plastic or cardboard lid that [3]:

- keeps the contents from spilling when walking or driving;
- protects your drink from outside dust;
- provides extra thermal insulation to keep your beverage at the right temperature.

Starting a new chain of fast food or a small shop selling cakes, tea and coffee, every entrepreneur can choose cups of suitable quality and volume at a reasonable price, and if so desired – order individual design of the outer wall of its “company” colors and logo. Stylish and convenient cups are an important element of the image of any company that wants to gain a foothold in the market by creating a positive image of its outlets among consumers.

So, what is the role of paper packaging in the modern world? Paper packaging first came into use back in 1827. That time the wax paper soaked in olive oil began to be used to package food. Later, that type of packaging was utilized very widely in the food industry. However, everything changed in the middle of the twentieth century.

Then polyethylene was used for packaging, the most necessary foodstuffs were packed in it such as bread, vegetables, and fruit. Over time, the new type of packaging became popular, as it was more profitable to produce. Polyethylene packaging reached its peak of popularity in 2002, when about 4–5 trillion of these bags were produced per year. Yet now, people are back to using paper material, feeling its superiority over polyethylene [4].

Paper wrapping can serve as an excellent field for advertising, therefore, it is more profitable for companies and firms to use paper bags and cardboard boxes for packaging their goods. They can accommodate more advertising information (phone numbers, addresses, etc.).

If to consider the role of paper packaging from the public point of view, it has the following feature. Nowadays, a lot of people are concerned about the environmental pollution and environmental friendliness of their food. Paper bags satisfy both of these conditions. Firstly, if one such product is thrown away, then it will not pose a threat to nature, as plastic bags do, but, on the contrary, can be recycled in order to reuse raw materials. This can save trees from being cut down and protect the environment from pollution. Secondly, the buyer does not have to be afraid for the products wrapped in paper bags, which do not harm them in any way.

One of the most important benefits of disposable paper cups, in addition to their environmental friendliness, is the ability to print ads on them. It does not take a long to explain that this way of posting information is extremely beneficial. Since it is almost impossible not to notice the image on the cup that you take in your hands. It is this property that advertisers use successfully [5].

So, to sum up, it is worth saying that the production of paper cups is a very promising project. Currently, on the territory of our country, competition in this niche is low, which makes the paper cup business an attractive direction.

However, this type of business is not suitable for aspiring entrepreneurs. First, business involves large investments. Secondly, effective marketing has a huge impact on the period of return on investment.

It is necessary to have a good knowledge of the management of production processes from the inside in order to easily cope with all obstacles and difficulties, and continue to move forward.

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## **ТЕХНОЛОГИИ ВИРТУАЛЬНОЙ РЕАЛЬНОСТИ В СУДОХОДСТВЕ VIRTUAL REALITY TECHNOLOGIES IN SAILOR'S WORK**

**Аннотация.** В данной статье автор проводит обзор разработки компании Pollen Robotics и его применение в практике судовождения. Из года в год происходит сокращение человеческого труда в море, из-за чего возрастает ценность каждого отдельного члена экипажа. Наряду с сокращением рабочих мест на судах профессия моряка крайне опасна, условия труда крайне тяжелые, каждая ошибка может стоить моряку жизни. Эффективное решение многих проблем, возникающих в процессе судовождения на современном этапе, обеспечивается технологией виртуальной реальности. С помощью современных технологий виртуальной реальности можно моделировать различные ситуации, с которыми сталкиваются судоводители.

**Abstract.** In this article, the author reviews the development of Pollen Robotics and its application in the practice of navigation. From year to year, there is a reduction in human labor at sea that is why the value of each individual crewmember increases. Along with the reduction of jobs on



ships, the profession of a sailor is extremely dangerous, working conditions are extremely difficult; every mistake can cost a sailor his life. An effective solution to many problems that arise in the process of navigation at the present stage is provided by virtual reality technology. With the help of modern virtual reality technologies, it is possible to simulate various situations that navigators face.

**Ключевые слова:** беспилотное судно, беспилотное плавание, морская промышленность, морской транспорт, морские технологии, виртуальная реальность.

**Key words:** unmanned ship, unmanned navigation, marine industry, marine transport, marine technologies, Virtual Reality.

The profession of a sailor was recognized as the most dangerous job in the United States in 2012 with a death rate of 121.2 cases out of 100 thousand. For comparison, the average indicator is about 3.5 among all professions. In addition, in the same year, 1051 fatal outcomes on ships were registered [1]. The first idea that comes to mind is to replace humans with robots. However, it's easy to say hard to do because it is not possible to replace human labor with artificial intelligence at sea. Since many things are tied to the human factor and because a robot without electricity will not be able to work, which means it will not be possible for it to take readings from a sextant or work with a map in hard situations. In this case, the risks for each crewmember can be reduced using the technologies of the 21st century. The most effective method of reducing risk for seafarers is the using of special robots that can be controlled using virtual reality technologies.

Virtual Reality (VR) is a simulated experience that can be similar to or completely different from the real world. Applications of virtual reality include entertainment (e.g. video games), education (e.g. medical or military training) and business (e.g. virtual meetings). Other distinct types of VR-style technology include augmented reality and mixed reality, sometimes referred to as extended reality or XR.

In 1979, for the first time, VR was integrated into a military helmet by McDonnell-Douglas Corporation. There was a tracking of the pilot's gaze so that the computer generated the necessary image. Moreover, three years later, Sayre gloves were created that could track hand movements. The tracking mechanism was as follows: light emitters and photocells were placed on the fingers. When moving, the amount of light falling on the photocell changed, which was converted into electrical signals.

In the early 90s, the Virtuality Group Company began producing arcade VR machines "Virtuality" with the help of which the gamers could play in a three-dimensional game world. The system allowed combining slot machines for multiplayer games, and popular arcade games, such as Pac-Man, made their own VR versions. Such mass entertainment made virtual reality clearer and closer to ordinary users and was able to popularize this direction of the gaming industry.

In our time, virtual reality is adapted primarily for video games. Technology equipment consists of a helmet that has a built-in screen through which observation takes place inside the game. As well as two joysticks through which hands are controlled, some games such as a military simulator Pavlov VR shows how exactly you can transfer things from reality to the game. In the game you can find weapons from different countries and eras, completely disassemble them down to the smallest details, given this, working with small details will depend on the accuracy of the robot's movements.

Progress does not stand still, but how close are we to remotely controlling robots using our own body, and not algorithms in a computer? In fact, they are very close; the company Pollen Robotics has recently provided for review a robot whose name is Reachy [3].

Reachy is controlled using the Valve index virtual reality helmet. Now this robot can only move the upper part of the body, twist the torso, move the arms, and use antennas to transmit the primitive emotions of its operator. A blogger from the Virtual Reality Oasis channel recorded a video from the robot's tests. Reachy is at the development stage but by this time he is able to sort out colored cubes in a children's toy, draw simple shapes on a piece of paper, and even make a sandwich.

When Reachy “grows up” and can reproduce the specified movements as accurately as possible, it can be used to perform work in hard-to-reach places, or in places of increased danger.

This robot does not guarantee the safety of a sailor, but it greatly increases the safety of many works that must be done but are very harmful to health. In our opinion, this technology will be very useful in sailor’s profession, not only to reduce the risk of work, but also to reduce the physical strain of hard work. They could also be used in emergencies, for example to fetch things from the deck in a storm. However, it is important that every crewmember has a certificate of training in this kind of technology and its associated tools, will it be robots or individual machines.

Unfortunately, our university does not use VR for teaching, although it could have a good impact on students' learning, because thanks to this technology you can simulate absolutely any situation on the ship, work on the bridge, in the engine room, the work of the watchman, even in jest, you could simulate the work of the cook.

If we talk about specific things, for example, ship security certificate courses, students could use Pavlov VR [2] to look at specific weapons models, learn all about their composition, how to disassemble them and how to use them; it would even be possible to simulate an attack situation on a ship and how to prevent a hijacking in specific situations.

For specific things, such as courses for a ship security certificate, students could use Pavlov VR to look at specific weapons models, learn all about weapons composition, disassembly methods, rules of engagement and even simulate an attack on a ship and how to avoid a hijacking in specific situations.

Concluding all said above about VR technologies in sailor’s work, it is necessary to add this kind of technology to the curriculum. When people come to study at a maritime institute, they understand that a mistake on a ship can cost a life and it can happen in seconds, and this technology, can show you mistakes that you could make. Thus, this technology reveals all the drawbacks, possible mistakes and dangerous situations in a sailor’s work so that it brings perfect learning experience that could be applied into practice while working at sea.

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## **ОСНОВНЫЕ ПРИНЦИПЫ ИЗГОТОВЛЕНИЯ КОМПОЗИЦИОННЫХ МАТЕРИАЛОВ BASIC PRINCIPLES OF POLYMER COMPOSITE MATERIALS MANUFACTURING**

**Аннотация.** Статья посвящена разработке композиционных полимерных материалов, широко используемых в современном машиностроении. Описаны два типа технологий производства композиционных материалов, а также их достоинства и недостатки. Метод инъекции ненасыщенной смолы считается привлекательной, универсальной и рентабельной альтернативой для производства композитов, а препреговая технология позволяет получать изделия сложной формы при минимальной инструментальной обработке. Полученные данные свидетельствуют о необходимости разработки отечественного материала взамен зарубежного композиционного материала.

**Abstract.** The article focuses on the development of composite polymeric materials which are widely used in modern mechanical engineering. Two types of technologies for manufacturing composite materials are described, as well as their advantages and disadvantages. Resin Transfer Molding method is considered to be an attractive, versatile and cost-effective alternative for manufacturing composites, while prepreg technology allows to obtain products of complex shape with minimal tool processing. The findings suggest that the development of the domestic material instead of foreign carbon materials are to be carried out.

**Ключевые слова:** лопатка вентилятора, свойство, полимерные композиционные материалы, полимеризационный наполнитель, пропитка.

**Key words:** fan blade, property, polymer composite materials, polymerization filling, impregnation.

The development of modern technology requires new structural materials being superior in strength, elasticity and other properties to traditional ones. Among the most interesting and promising are polymeric materials (plastics, elastomers, fibers), and primarily filled ones. Structural polymeric materials are increasingly employed in modern mechanical engineering, and they are used in cases in which no other material meets the ever-increasing requirements of new technology. Currently, polymers and based on them materials have displaced such basic structural materials as reinforced concrete, metal, wood, etc.

It worthwhile noting the possibilities of polymeric materials which are extremely wide due to their variety and fillers, the unfailing variability of composites based on them and their modification methods. For a long time, the main technological method for obtaining polymer composites has been mechanical mixing of a filler and a polymer matrix. Polymerization filling – chemical grafting of a catalyst or initiator to the surface of the filler and subsequent polymerization or copolymerization of monomers on these surfaces – may open a new page in the chemistry and technology of composites. The development of the technology of composite polymer materials is currently determined by scientific research in the field of polymer materials science, since the problem of the interaction of

fillers and matrices is very multifaceted. Mankind is faced with polymer materials not only in technology, but also in everyday practice, therefore, knowledge of the basic properties of these materials and the ability to use them correctly are gradually becoming necessary for an ever wider circle of people. Currently, leading foreign and domestic scientists are actively conducting research aimed at the development of materials and technologies to reduce manufacture costs of products from polymer composite materials [3].

One of the main methods of manufacturing composite materials is considered to be the Resin Transfer Molding (RTM) method that is impregnation under pressure. The features of RTM technology are that the reinforcing filler in the required amount is placed in a closed mold, and a binder is fed into it through the drainage system under pressure. The impregnation process continues until the binder fills all the free spaces of the mold. After impregnation, the mold is placed in an oven or press, where the part is cured. If cold curing compositions are used as a binder, the molding process takes place at a room temperature. The advantages of this method are the usage of cheap equipment and three-dimensionally reinforced fillers as well as the manufacturing of complex shape parts. The disadvantage of this method is the complex technological process of manufacturing tooling (Fig. 1).

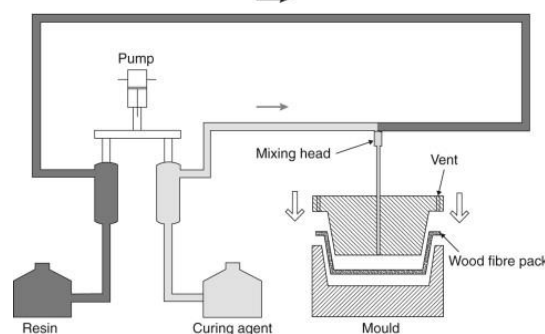


**Figure 1.** The scheme of manufacturing parts by RTM method

It should be noted that the laying of a package from a dry reinforcing filler into a rigid or semi-rigid form is currently carried out manually. This leads to deviations of the obtained reinforcement scheme from the specified one and determines the scatter of the physical and mechanical properties of the material in the range of even one batch. In this case, the properties of the material in the structure can change not only due to variations in the orientation angles of the layers during manual package stacking, but also when unregulated overlaps or gaps appear in the package. The latter can change the range of the filtration rates of the binder through the reinforcing package, which can deform when the mold is closed, and lead to the emergence of areas with insufficient impregnation or an increased content of the binder.

The development of RTM technologies for creating critical structures is impossible without modeling the technological process of impregnation. For this purpose, the filtration of a viscoplastic fluid in a porous medium is used. They are usually solved using specialized software packages, for example, PAM-FORM and PAM-RTM. As a result, velocity and pressure fields of the binder impregnating the reinforcing frame are determined, and the movement of the impregnation front is analyzed depending on the parameters of the technological process (time, temperature, pressure). This makes it possible to estimate the amount of binder and the time required for complete impregnation of the frame, to select the most rational options for the placement of the binder supply and outlet points and vacuum ports, and also to prevent the creating of defects in the form of non-impregnated zones. At the same time, for a complete description of the RTM technological process, it is necessary to formulate the related problem of filtration of a viscoplastic fluid and elasto-viscoplastic deformation of the reinforcing frame. The solution of this problem will make it possible to obtain the stress and strain fields of the frame. It prevents undesirable displacement of the reinforcing layers, which cause the formation of a number of defects in the material structure. In particular, the emergence of high longitudinal and low transverse compressive stresses in the carcass layers can lead to the formation of folds and resin pockets, and the emergence of high transverse compressive stresses in the areas of thickening and overlap of the layers can lead to a decrease in the filtration rate and the

appearance of areas with a low content binder. Subsequently, a promising direction in the RTM technology is the use of three-dimensionally reinforced frames made by an automated method. In this case, the geometric parameters of the reinforcement cell and, accordingly, the density can vary at different points of the frame, providing reinforcement of the structure in the most loaded zones. The development of a technology for impregnating three-dimensional frameworks in a closed form is a rather difficult task with a very limited number of similar technical solutions already implemented [2].

Furthermore, it is worthwhile to describe the preparation of composite materials by prepreg technology. Prepregs are composite materials in which a reinforcement fiber is pre-impregnated with a thermoplastic or thermoset resin matrix in a certain ratio. Prepregs have unique properties as they are cured under high temperatures and pressures. Prepreg technology allows to obtain monolithic products of complex shape with minimal tool processing. The advantages of this method is the possibility of obtaining materials with relatively high strength characteristics without additional processing. However, the disadvantages include the short life of the products, the restrictions imposed on the binders used due to the need for further molding of the material, as well as the high cost of the equipment.

It is the United Engine Corporation of Rostec State Corporation (part of the Union of Machine Builders of Russia), while creating the PD-35 engine, that is working on the manufacture of a fan blade made of polymer composite materials using prepreg technology and 3D weaving. Comparative tests of products manufactured by two methods are planned for 2021. In order to reduce risks, it was decided to work out two technological directions: laying of a prepreg into a mold with subsequent polymerization in an autoclave (prepreg technology) and the formation of a three-dimensional woven reinforcing frame with subsequent impregnation under pressure in a mold and polymerization (3D weaving technology). The new technology is being worked out in the dimension of the PD-14 engine (the blade size is 750 mm, not 1250 mm).

Subsequently, the use of wide-chord fan blades made of polymer composite materials in the engine design is a prerequisite for the implementation of the PD-35 program [1]. The technology of creating polymer composite blades is crucial – it relates to the most promising areas of research and meets extremely high quality and efficiency requirements. It will not be possible to achieve the target competitive characteristics of the engine being developed without this technology. Future work should focus on the development of the domestic material instead of foreign composite materials.

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**ЛОГИСТИЧЕСКИЙ КОНСАЛТИНГ КАК БУДУЩЕЕ  
В РАЗВИТИИ КОНСАЛТИНГА И ЛОГИСТИКИ  
LOGISTICS CONSULTING AS A FUTURE STEP FOR  
THE DEVELOPMENT OF CONSULTING AND LOGISTICS**

**Аннотация.** В статье рассматривается логистический консалтинг как новое направление консалтинговой деятельности. Представляется ретроспективный взгляд на возникновение и развитие консалтинговых услуг. Объясняется смысл таких понятий, как консалтинг, консультационные услуги, управленческий консалтинг. Описывается современное состояние рынка консалтинговых услуг в мире. Проводится сравнительный анализ состояния дел с консалтингом в зарубежных странах и России. Перечисляются проблемы, решению которых может способствовать консалтинг, а также методы логистического консалтинга. Одной из тенденций для дальнейшего развития логистической сферы во время цифровизации рассматривается ответвление управленческого консалтинга, а именно логистический консалтинг. Обозначаются основные проблемы, которые сопровождают логистический консалтинг на современном этапе его развития. Выражается надежда, что логистический консалтинг в скором будущем выделится в прикладную науку.

**Abstract.** The article deals with logistics consulting as a new branch of consulting activity. A retrospective view towards the origin and development of consulting services is presented. The meaning of such concepts as consulting, consulting services, management consulting is explained. The current state of a global consulting services market is described. A comparative analysis of consulting in foreign countries and Russia is conducted. Problems that can be solved with the help of consulting, as well as methods of logistics consulting are listed. A tendency for further development of the logistics sphere within its digitalization is considered as a branch of management consulting, namely, logistics consulting. The key problems to accompany logistics consulting at the present stage of its development are outlined. It is hoped that logistics consulting will become an applied science in the near future.

**Ключевые слова:** ИТ, аутсорсинг, консалтинг, управленческий консалтинг, логистический консалтинг, логистика.

**Key words:** IT, outsourcing, consulting, management consulting, logistics consulting, logistics.

Consulting is an extensive activity for advising manufacturers, consumers, buyers, sellers in a wide range of issues of economics, finance, foreign economic relations, in the field of technological, technical, expert activities. This is professional assistance to business leaders, managers, and entrepreneurs in solving problems facing them, carried out in a form of advice, recommendations and joint development of programs and solutions for the implementation of these programs.

The history of consulting services formation began with legal services, since issues related to various economic activities cannot do without the help of lawyers and notaries for quite a long time. As the economy develops and its structure becomes more complex, as well as the development of socio-economic relations, new areas of professional services appear such as consulting in economics, management (management consulting), trade, social interaction, technical development.

The expanding needs of businesses determine the different types of consulting. Despite the great variety, this article deals with the logistics consulting. Speaking about what consulting is, this type of activity is implied most often. Consulting emerged as an aid to managers in creating an effective management system. This kind is common. After the consultant identifies problems, for example, insufficiently thought-out financial flows, the need for additional training of personnel, etc., the company can solve them with the involvement of narrower-field specialists.

At the present stage of development of the market economy in Russia, most of companies strive to build their activities based on logistics to achieve their market goals with a minimum investment of time and resources. In a tough competitive environment, there is an interest in maintaining competitiveness with constant changes in technologies, sales markets and customer needs, which forces us to continuously rebuild corporate strategy and tactics. Only now, more often than not, there are not enough internal resources for this to timely respond to the ongoing changes, so organizations have to seek help from qualified consultants or enterprises specializing in the provision of consulting services, in particular, logistics consulting.

All enterprises should over time focus on logistics tasks in the face of cyclical market changes – growth, decline, stabilization. Solving problems in such areas as: procurement and supply, transport and delivery, distribution are key both in the growth of sales and in their decline. Often companies also realize that there is potential for optimization in their logistics processes, whether it is cost reduction and / or quality improvement, therefore, the use of logistics opportunities and the acquisition of competitive advantages becomes fundamental in the strategic development of the company. Then organizations have to turn to the services of professionals in various industries in order to increase the effectiveness of their activities. It is here, by the way, that “logistics consulting” is relevant.

Even though there is no unified approach to the essence of the integral term “logistics consulting”, it is possible to characterize separately each concept concerning it.

Logistics is as a category of activity that is associated with the organization and optimization of various kinds of flows, such as commodity, financial, information, etc. [3].

Counseling is a contracted facility that provides services to enterprises with the help of specially trained and qualified persons, analyzing customer problems, giving recommendations on how to solve them, and, if possible, assist in this.

Consulting is a type of counseling. Considering the various definitions of this term, in general, we can say that this is a type of intellectual activity provided by specialized personnel to a client to help solve his management problems.

Thus, we can formulate the definition of “logistics consulting”, namely, it is an intellectual type of activity performed by specialized objects (for example, a company), the essence of which is to provide professional assistance to economic enterprises on a wide range of logistics issues, including its different areas. It is an offshoot of management consulting.

Logistics consulting today is a complex procedure for identifying and solving complex logistics problems in combination with strategic planning of the company's development [4]. The difference between logistic consulting and ordinary management consulting is in the field of application, namely, the first one is engaged in the optimization of various logistic activities, such as logistic actions, operations or functions that are aimed at improving any processes associated with the movement of material, financial and information flows.

With the help of such consulting, we can solve a number of key problems that reduce the effectiveness of the organization's management. For example, such problems include [4]:

- shipped orders to customers arrive at the wrong time;
- fulfillment of orders with errors (quantity or assortment);
- an increase in refusals from orders and subsequent future transactions, which negatively affects the level of logistics service;
- excess of warehouse stocks over the standards;
- the presence of staff turnover, etc.

The main methods for solving the assigned tasks within the framework of logistics consulting are:

- description of business processes using the IDEF and ARIS methodology;
- expert methods;
- modeling using probabilistic and statistical methods of simulation modeling;
- methods of heuristic analysis and synthesis;
- methods of linear, nonlinear, dynamic, and stochastic programming for solving optimization economic problems;
- methods of structural analysis and structural optimization.

Each logistics consulting project is unique, since the tasks and goals of logistics of different organizations are diverse, and the budgets for the implementation of changes are also different. Due to this, the approaches to the scope of work and methods of their implementation, even within the framework of one consulting company, are diverse.

The global consulting services market is diverse and progressing well. According to the consultancy.org online platform, which deals with the consulting and consulting industry, it is noted that over the next thirty years, starting in 1960, there has been an unprecedented growth in the consulting business in the West, ahead of the growth of the world economy. Thus, the revenues of the world's ten leading consulting firms rose from about \$200 million to \$50 billion at the beginning of the 21st century, while the workforce of the thirty largest consulting firms grew from about 20,000 in the early 1980s to about 430,000 in 2000. In the next two decades, consulting became one of the most developed areas in the professional services industry, generating from \$100 billion to about \$300 billion in revenues, as indicated in Figure 1.

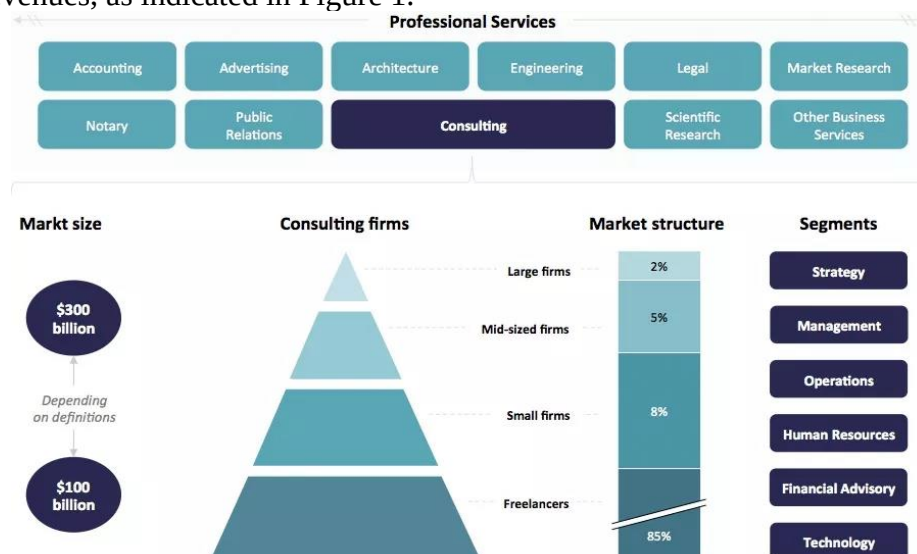


**Figure 1.** Consulting services market



Consulting was so widespread that in the United States in the 1970s there was 1 consultant for every 100 managers in industry. In the 80s, the term “consultant-to-labor ratio” appeared that is the ratio of the total number of the country's inhabitants to the number of consultants. So, the highest “consultant-to-weight ratio” in the world is in Japan, where there is one consultant for every 2.5 thousand inhabitants. In the United States, one consultant accounts for 4.5 thousand people, in Western Europe – for 12.5 thousand people. Developing countries are characterized by an extremely low “consultant-to-labor ratio”: as a rule, one consultant accounts for 250-500 thousand people. Since the early 1960s, G8 accounting firms have also started to engage in management consulting: Arthur Andersen, Arthur Young, Coopers and Lybrand, Deloitte Haskings and Sells, Ernst and Whinney, Peat, Marwick, Mitchell, Price Waterhouse, Touche Ross. In 1989, four of them merged: Arthur Young and Ernst & Whinney into Ernst & Young, Deloitte, Haskins & Sells and Touche Ross into Deloitte & Touche. As a result, there were only six left. And in 1998, Price Waterhouse and Coopers & Lybrand became PriceWaterhouseCoopers – thereby reducing the Big Six to Big Five. It was not a merger, and after the US scandal with the energy company Enron, which was audited by Arthur Andersen, the Big Five became the Big Four.

According to the data published in Interfax, which are given below, in table 1, the number of employees of the Big Four and revenues are indicated according to the latest available data.

**Table 1.** Information on the "Big Four"

| Company  | Revenue         | Number of employees | Revenue for 1 employee | Year | Location headquarters |
|----------|-----------------|---------------------|------------------------|------|-----------------------|
| Deloitte | \$46,2 billion  | 312 028             | \$148 077              | 2019 | UK / USA              |
| PwC      | \$42,45 billion | 276 005             | \$153 794              | 2019 | UK / USA              |
| EY       | \$36,4 billion  | 284 000             | \$128 169              | 2019 | UK / USA              |
| KPMG     | \$29,75 billion | 219 281             | \$135 671              | 2019 | Netherlands           |

Speaking of Russia, the consulting business came into existence in 1987, but began to develop actively in the 1990s, when Russia moved to a market economy. Since then, many private enterprises with various forms of ownership have appeared, several times I have been transformed into business technologies embedded in Russian and foreign capital, business technologies have stepped far forward.

The stage of formation of the market of consulting services fell on the end of the eighties – 1992. There was a breakdown of the planned economy in the Soviet way, enterprises became more and more independent and self-sufficient in economic terms, the principles of party management were destroyed. All these hasty changes have resulted in significant damage to entire industries and the state economy. The ineradicable habit of acting on orders from above has led to the confusion of many leaders. Actually, in such a situation, a huge demand for consulting services could not but arise. Managers unable to effectively manage in the new realities had to resort to the advice of narrow specialists in the field of market economy, experts in various fields of production, lawyers who are free to navigate the new Russian laws regulating capitalist relations new for the country [1].

The next stage in the development of consulting services (namely, assessment and examination) came in the fall of 1992 – early 2000. Although many privatized enterprises were catastrophically and often fatally unable to cope with the situation, they had nothing to pay for the services of consulting firms. A paradoxical contradiction arose: with a huge demand, the demand for consulting services was minimal. As a result, consulting companies have practically disappeared in the regions. Large domestic enterprises preferred foreign consultants, including those on anti-crisis management. Domestic specialists were often forced to write business plans, legal and tax advice.

This stage, which began at the beginning of the XXI century, can be attributed to the renaissance of the consulting services market in Russia. The positive dynamics of demand, the growth of professionalism of consulting specialists, the expansion of the consulting area are the characteristic features of the modern stage. Now consulting firms are involved in solving, among other things, such

problems as developing strategies for the development of enterprises, systems for motivating personnel to productive work, rationalizing the schemes of business processes of companies, developing mechanisms for the decision-making process, assessing and improving the current financial efficiency of the company, developing logistic models and schemes, etc.

According to the data of the RAEX rating agency (Expert RA), which are provided in Figure 2, it can be seen that the lion's share of their total revenues in 2018 was formed from IT consulting services: 66 percent, or 51.3 billion rubles. Most of the revenue here – 33.1 billion rubles – comes from development and system integration, another 18.2 billion rubles – from management consulting. In addition to the traditional needs of customers in the automation of business processes, demand is also fueled by digitalization. Operational and HR consulting services are in much less demand than in the global market. This is partly due to the redistribution of importance and the expectation of return on consulting services, which are typical for Russian production.



**Figure 2.** Consulting business revenue structure in Russia at the end of 2018, %

The demand for IT consulting is largely supported by the government customer. Both within the framework of informatization programs and within the framework of the automation of current activities. IT services are currently the most in demand in the domestic market, especially in the context of the implementation of the National Project “Digital Economy of the Russian Federation”. They allow companies to exist quite comfortably in the new realities, including in the remote operation mode [2]. Consulting in Russia is developing in its own way, this market is a very young relatively developed country, so in some periods it has to go at an accelerated pace. Russian consulting is striving for development, while facing a number of problems, in particular, this is the lack of a regulatory framework, poor development of consulting in the regions, lack of statistical estimates, difficulty in obtaining them.

Currently, the market for consulting services is faced with problems of a different kind.

Firstly, all the leading firms in the industry are metropolitan organizations. Their successful activity can be easily explained by their favorable location, the possession of qualified personnel, and more pronounced cooperation with foreign consulting firms. In this situation, regional firms face competition, which they do not have the resources to fight, and often go bankrupt. Regional potential clients prefer to turn to large firms, whose experience and resources are more significant, or they turn to Moscow, since there are no such firms in their region.

Secondly, there are no rules and regulations that govern the consulting services market. The lack of uniform professional standards and ethical norms of consulting activities and methods of enforcement to comply with them complicates the functioning of firms, as well as directly analyzing this market.

Thirdly, there is a distrust of consulting among entrepreneurs: they are afraid of leakage and selfish use of information. The demand for consulting services in most cases depends on whether the

organization has its own specialists or internal consultants. When problems arise in an organization that are directly related to its economy and management, first of all, of course, the possibilities of their solution using internal human resources are considered. The problem is that the organization is not always able to develop an effective action plan itself, having formed the necessary team of specialists and internal consultants with the appropriate knowledge and experience to solve problems in order to implement the necessary changes within an acceptable time frame and obtain the required results.

The involvement of consulting companies in solving logistics problems has both pros and cons. The pros include [3]:

- 1) consulting companies have a well-developed methodological and technical base;
- 2) existing experience in solving logistics problems at various enterprises;
- 3) obtaining an independent analysis from a disinterested party, an objective assessment of the logistics component of the business;
- 4) focused analytical work of consultants to develop proposals to improve the efficiency of logistics;
- 5) the availability of a database of information regarding the logistics services market, the experience of other firms, etc.
- 6) directing the attention of employees of the enterprise to the main functions of the company's activities.

Possible cons include the following aspects:

- 1) schemes used by consultants are not sufficiently adapted for a specific enterprise;
- 2) that the consultants, in comparison with the personnel, have less information about the given enterprise, perhaps insufficient knowledge of the production technology;
- 3) the possibility of leakage of commercial information.

The listed disadvantages can be avoided through high-quality selection of consulting companies and close partnerships based on mutual trust. One of the main difficulties in conducting this type of consulting is that many types of information cannot be obtained in the course of diagnosing logistical problems due to the fact that companies often lack an internal information system. Information, even if it is stored, is mainly on paper, and this greatly complicates its analysis.

Among the most important reasons for the rapid development of logistics consulting and the growth in demand for consulting services in the global market are the following:

- the general trend of business globalization, which contributes to the demand for consulting services both among transnational corporations capturing new markets, and among newly created companies that hope to position themselves in the global market,
- the ability to use the ideas and talent of the consultant as competitive in the market struggle,
- the need for the introduction of information technology, which can significantly increase the productivity of the enterprise.

Today in Russia there is an acute shortage of firms providing consulting in the field of logistics. It is obvious that the market for such services will develop, since its capacity will be largely affected by the existing discrepancy between the processes of the real need for intellectual support of the necessary changes in the field of logistics at enterprises and the professional level of personnel training. In the future, logistics consulting may well claim to be an independent applied science, which has its own subject of scientific research, methods of cognition of phenomena and a system of knowledge.

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## **ПЕРСПЕКТИВЫ РАЗВИТИЯ СТРОИТЕЛЬСТВА ТАНКЕРОВ PROSPECTS FOR THE DEVELOPMENT OF TANKER CONSTRUCTION**

**Аннотация.** В статье рассмотрены общие характеристики и типы танкеров. Представлены архитектурно-конструктивные особенности судов данного типа. Сообщается, что танкер перевозит наливные грузы и транспортирует большую часть мировых потребностей в энергии. Приведены архитектурные и конструктивные особенности судов данного типа. Отмечается, что танкеры могут быть разных размеров и грузоподъемности от 150 до 500 тысяч тонн. В настоящее время строятся танкеры максимально возможного размера. Благодаря автоматизации танкеры не требуют большого количества экипажа. Приводится классификация танкерных судов и их перспективы развития. Был сделан вывод,

что правила и положения, применяемые при проектировании и строительстве танкеров, в первую очередь разрабатываются ИМО и классификационными обществами.

**Abstract.** The article deals with the general characteristics and types of tankers. It is stated that tanker carries liquid cargo in bulk and is responsible for transporting most of the world's energy needs. The architectural and structural features of this type of vessels are presented. It is noted that tankers could be of various sizes and carrying capacities ranging from 150 tons to 500 thousand tons. Currently, tankers of the largest possible size are built. Due to automation, tankers do not require a large number of crew. The classification of tanker ships and their development prospects are given. It was concluded that the rules and regulations applied for the design and construction of tankers are primarily developed by the IMO and the classification societies.

**Ключевые слова:** танкер, грузовая система, танкеры-газовозы, жидкий водород, танкер Suiso Frontier.

**Key words:** tanker, cargo system, gas tankers, liquid hydrogen, LPG Tanker Suiso Frontier.

Currently, the largest component of seaborne cargo movements is tanker transportation, accounting for approximately one-third part of all cargoes shipped by sea. It provides “a vital link in facilitating the movement of oil and petroleum products from their limited sources of origin to their innumerable destinations the world over” [8, p. 1]. “Tanker rates rise as high oil prices appear...” [5].

Recently “the global trade of crude oil, refined petroleum products, gas and chemicals reached 3.2 billion tons, according to UNCTAD” [13].

“Because of the high level of shipbuilding activity in recent years, a significant portion of the world tanker fleet is designed and maintained to these enhanced standards. Many of these new regulations became de facto industry practice well before the International Maritime Organization (IMO) regulations [7] were officially adopted and implemented” [6, p. 2]. A tanker is a cargo ship designed for the transportation of liquid cargo, such as crude oil, oil refined products, liquefied gas, chemical products, and various liquids. Tankers are used on river and sea waterways. They are often equipped with double bottom and sides to increase the safety of sailing [6]. “It is a great engineering challenge to design new ship systems that make future shipping a more efficient, safe and environmentally friendly transportation means...” [9, p. 362].

Some scientists' works focus on the preparation of natural gas and crude oil for transportation and the methods used to move and store them from the well (Speight G. James, Kumar N. Shashi, Coyne M.) [5; 8; 11].

The purpose of the scientific study is to analyze the general characteristics, types of tankers and their development prospects.

“Most crude oil and natural gas fields are at a considerable distance from the refineries that convert crude oil into usable products, and therefore the oil must be transported in pipelines and tankers” [11, p. 191]. The tanker segment is divided into the sub-categories: Gas Carriers, Oil tankers and Chemical Tankers.

“Oil and chemical tankers are recognized by their long flat decks in front of the accommodation on top of which is present the network of cargo and ballast pipelines and vents” [13].

There is another classification: by designation, tankers are divided into several groups that are designed:

- a) to carry crude oil – oil tanker;
- b) to transport oil refined products – product tanker;
- c) to transport chemical products – gas tanker;
- d) to transport and supply ships at rest or on the move with fuel, oils and various liquids – bunkering tanker [2; 3].

Tankers can be of various sizes and carrying capacities ranging from 150 tons to 500 thousand tons. Currently, it is possible to build tankers of the largest size. Due to automation, tankers do not require a large number of crew (on average 15–30 people) [2; 3].

Personnel accommodations are located in the superstructure at the rearmost part of the vessel. Tankers have a large number of holds designed for storage and transportation of bulk cargo. These spaces occupy most of the ship's hull. The tanker's cargo device consists of pipelines and pump systems designed to receive bulk cargo, its distribution to tanks, unloading and pumping.

Figure 1 shows a general arrangement drawing of a gas tanker. The vessel is designed to transport liquefied gas under pressure in spherical tanks.

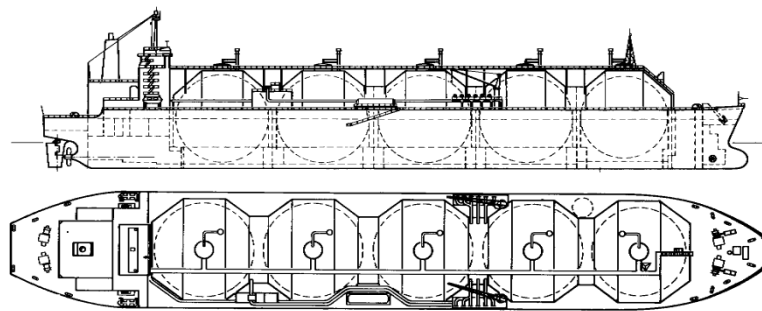


**Figure 1.** General arrangement drawing of a gas tanker

In addition, one should consider architectural and design features. “Some of the more significant regulatory actions include: (1) double hull requirements for cargo tanks and subsequently for fuel tanks, (2) cargo tank subdivision requirements intended to mitigate outflow in the event of a collision or grounding, (3) requirements for the coating of ballast tanks and the tops/bottoms of cargo tanks to minimize corrosion, (4) new structural design rules common across classification societies, and (5) requirements for enhanced surveys to maintain structural integrity” [6, p. 2].

The engine room is located at the rearmost part of the vessel to keep it away from fire hazardous cargo. The superstructure is arranged above the engine room [1]. To reduce the force of liquid cargo impacts during pitching, the tanker's hull is divided by transverse bulkheads. To reduce the remains of a viscous cargo after unloading, on the structures enclosing cargo tanks, the reinforcing beams of the bulkheads and flooring are placed in the double bottom and in the double sides [2].

The cargo system consists of pipes with a diameter of 250–350 mm. They are situated along the bottom of the cargo tanks to the pump room. For the transportation of liquefied gas, tanks with a spherical shape are used. They can be built-in and independent (there are three types: A, B, C, as well as membrane). After major accidents, it is not recommended to build single-skin tankers; therefore, all tankers under construction have a double bottom and double sides [2].

To increase stability, tankers have ballast tanks located in a double bottom and side as a part of the ship's hull [10]. Picture 2 shows a drawing of the amidships frame of an oil tanker.

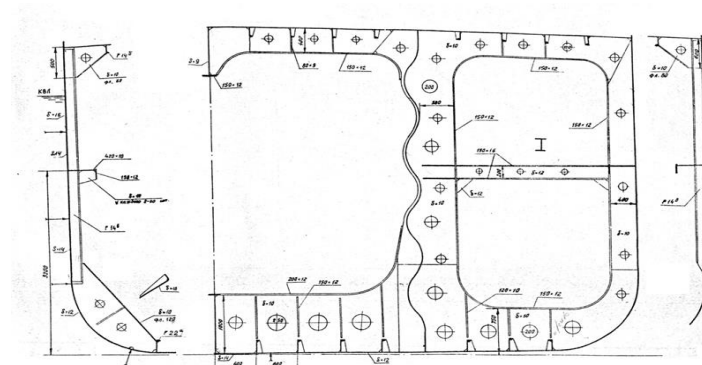


**Figure 2.** The drawing of the amidships frame of an oil tanker

Nowadays, there is an increase in the construction of tankers. Despite the oil prices reduction, there is still a high demand for liquefied gas. For example, Russia has already begun construction of the fifth tanker for the transportation of liquefied gas. Currently, there is already a tanker for the liquid hydrogen carrying – SUIISO FRONTIER. LPG Tanker SUIISO FRONTIER is located at Japan coast (Figure 3).

“SUIISO FRONTIER (IMO: 9860154) is a LPG Tanker that was built in 2020 and is sailing under the flag of Japan. Its carrying capacity is 69219 cubic meters Liquid Gas and her current draught is reported to be 4.5 meters. Her length overall (LOA) is 116 meters and her width is 19 meters” [12].



**Figure 3.** LPG Tanker SUIISO FRONTIER [12]

Thus, particular segment of the ocean shipping industry is presented by tanker transportation. Currently, there is an increase in the construction of tankers. “The rules and regulations applied for the design and construction of oil tankers are primarily developed by the IMO and the classification societies” [6, p. 3]. An important part of the development of the tanker fleet may be the global trend of hydrogen fuel, for the transportation of which gas tankers can be used.

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## **ЭЛЕКТРОТЕХНИКА И ЭКОЛОГИЯ ELECTRIC VEHICLES AND ECOLOGY**

**Аннотация.** В данной статье рассматривается довольно спорный вопрос улучшения экологии – электроавтомобили. Затрагиваются плюсы и минусы, процесс производства, количество выбросов и наносимый вред, а также последствия использования автомобилей с электрическим двигателем. Приводятся данные исследований, статистика производства и последующие экологические выбросы. Отмечено, что увеличение потребления лития и алюминия ведет к другим, отложенным проблемам экологии. Они будут вынесены за пределы мегаполисов, но со временем начнут влиять на всю окружающую среду. Автор приходит к заключению, что комплексной оценки влияния всех факторов пока не существует.



**Abstract.** This article discusses a rather controversial issue of improving the environment - electric cars. The pros and cons, the manufacturing process, the amount of emissions and damage done, and the consequences of using electric vehicles are considered. Research data, production statistics and subsequent environmental emissions are provided. It is noted that an increase in the consumption of lithium and aluminum leads to other, delayed environmental problems. They can be taken out of megacities, but over time they will begin to affect the entire environment. The author comes to the conclusion that a comprehensive assessment of the influence of all factors does not yet exist.

**Ключевые слова:** электромобили, энергия, экология, производство, топливо, загрязнение.

**Key words:** electric vehicles, energy, ecology, production, fuel, pollution.

According to statistics, road transport accounts for around half of air pollution. That's why some countries want to accelerate the number of electric cars. Many countries believe that they will be able to reduce carbon emissions to zero by 2050. A big role in that will be played by electric cars.

“What's more, EVs can also help with noise pollution, especially in cities where speeds are generally low. As electric cars are far quieter than conventional vehicles, driving electric creates a more peaceful environment for us all” [6]. Put simply, just one electric car could save an average 1.5 million grams of CO<sub>2</sub>. The scientists found that “in 95% of the world, driving an electric car is better for the environment than driving a gasoline-powered car” [5].

The purpose of the scientific study is to analyze the consequences of using electric vehicles.

The issues of improving the environment were analyzed by Russell Gold, Jessica Kuronen, Elbert Wang, Choudhury Saheli Roy and others.

In 2012, the Tesla Model S electric car made a miracle in the world market, comparable to the effect of the iPhone in 2007. The founder of the company, Elon Musk, talked about the revolution in the field of transport, saving the planet from greenhouse gases and, in general, presenting “environmentally friendly” future [8]. Nowadays, the popularity of electric vehicles is growing. Their advertising is based on a constant assertion of a high degree of environmental friendliness: the electric car does not emit any substances into the air and does not pollute the environment, and the energy for charging stations is taken from solar panels [7].

The key structural difference between electric vehicles and traditional cars with gasoline, diesel or gas engines is the electric type of engine, powered by rechargeable batteries. While electric vehicles can draw energy, including from solar panels or fuel cells, their designs include such batteries anyway. As modern manufacturers of electric vehicles assure, the main advantage of such cars is high environmental friendliness, since there are no emissions, no oil products, antifreezes, oils – both motor and transmission oils – are used. Some experts believe that “the full benefits of EVs will be realized only after the electricity sources become renewable, and it might take several decades for that to happen” [5].

Undoubtedly, one could agree with such an argument, since, at first glance, the obvious advantage of electric cars is the absence of emissions into the city air during current operation. At the same time, according to scientists, the degree of environmental safety of a car should be determined not only by the consequences of its operation [9], but also by a number of other factors. The experts at the University of California (USA) suggest that the entire life cycle of electric vehicles should be taken into account – from the production stage to recycling, including the processes of replenishing energy and servicing cars (Figure 1).

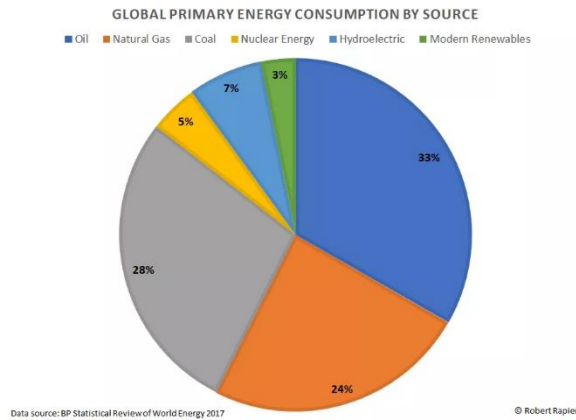


**Figure1.** Global primary energy consumption by source

The harm to the environment is considered in terms of the amount of CO<sub>2</sub> (carbon dioxide) emitted. Naturally, for an electric car, this figure tends to zero. However, this is far from the only harm caused by cars [3].

Moreover, for some reason, such a certification system made it possible to destroy fairly clean diesel engines in favor of gasoline ones. In this case, the former emits mainly low-octane impurities, soot and CO<sub>2</sub> [4].

The fact is that any car emits not only dangerous substances, but many other things as well. In the first place, surprisingly, tire remains. Rubber dust has become a metropolitan nightmare. Now it is a suspension of particles from the tires of countless cars. Unfortunately, electric cars do exactly the same thing. But “non-plug-in hybrid cars with internal combustion engines currently emit about 275 grams of CO<sub>2</sub> per mile. In 2050, their projected emissions are expected to be between 160 to 205 grams of CO<sub>2</sub> per mile – the range is wider than EVs, because fuel standards vary from place to place” [5].

The lubricants and mineral oils of EVs is a problem as well. There are fewer traces than from internal combustion engines, but they are still there.

Finally, the flavors provide the danger. Automotive chemicals are much more dangerous than CO<sub>2</sub> - that only creates a greenhouse effect; aerosols “eat up” the ozone layer.

Unfortunately, the process of operating cars is a poser. The creation of a technological masterpiece itself is more harmful than it is believed [2].

The fact is that most of the electricity is generated in thermal power plants that use mainly coal. With the switch to electric vehicles, the consumption of electricity generated by air-polluting stations is only growing [1].

Scientists have found that for every kilowatt-hour of energy generated for electric vehicles, up to 274 grams of carbon dioxide are emitted into the air. For comparison, per kilowatt-hour of energy generated by burning gasoline in internal combustion engines, carbon dioxide emissions do not exceed 180 grams. It is impossible to say unequivocally that electric vehicles will not become harmful. In a number of regions, their operation is fraught with such difficulties that it becomes impossible with a reasonable approach, as well as green energy.” Even if everyone drove EVs instead of gasoline-powered cars, there would still be plenty of emissions from the plug-in vehicles due to their sheer volume...” [5].

In addition, the increased consumption of lithium and aluminum leads to other, delayed environmental problems. They will be taken out of megacities, but over begin to affect the entire environment (figure. 2). Efforts to cut down pollution across various industries are expected to further reduce the environmental impact of EV production and charging over time.



**Figure 2.** Effect of lithium mining on soil

Unfortunately, a comprehensive assessment of the influence of all factors does not yet exist. And, most likely, it will never happen: both the gasoline and electric tycoons have their own influential businessmen and politicians.

Thus, we tried to answer the question: are electric cars better for the environment? On the one hand, the major benefit of electric cars is the contribution that they can make towards improving air quality in towns and cities. “With no tailpipe, pure electric cars produce no carbon dioxide emissions when driving. This reduces air pollution considerably” [6]. EVs produce fewer emissions overall than their gas-powered counterparts.

On the other hand, electricity grids are still powered by fossil fuels such as oil or coal, and EVs depend on that energy to get charged. Separately, EV battery production remains an energy-intensive process.

A goal of the Paris Agreement is to help prevent the global average temperature from rising more than one-two degrees Celsius. Cumulative vehicle emissions are assumed to be limited to 39 gigatons between 2020 and 2050.

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**ДИНАМИЧЕСКИЕ НАГРУЗКИ В ТРАНСМИССИИ, ВОЗНИКАЮЩИЕ ПРИ  
ВКЛЮЧЕНИИ СЦЕПЛЕНИЯ  
DYNAMIC LOADS IN THE TRANSMISSION THAT OCCUR WHEN  
THE CLUTCH IS ENGAGED**

**Аннотация.** В настоящей статье рассматривается возможность использования четырех- и трехмассовой моделей трансмиссии при исследовании динамических нагрузок в трансмиссии при различных скоростях включения сцепления. Для целей исследования используется расчетный метод. Доказывается, что для многих практических расчетов динамических нагрузок достаточно использовать упрощенную трехмассовую однорычажную динамическую модель. Все физические величины представлены в виде формул, а также дано определение каждого элемента и информация о том, какую функцию он выполняет. На рисунках показаны физические явления, которые обсуждаются в статье.

**Abstract.** The article is concerned with the possibility of using four-and three-mass models of the transmission within the study of dynamic loads in the transmission at different rates of clutch activation. A calculation method is used for the research. It is being proved that for many practical calculations of dynamic loads it is sufficient to use a simplified three-mass single-link dynamic model. All physical quantities are presented in the form of formulas as well as a definition of each

element and information about what function it performs are provided. The figures show the physical phenomena that are discussed in the article.

**Ключевые слова:** трансмиссия, сцепление, момент, динамические нагрузки, дифференциальные уравнения движения, динамическая модель трансмиссии.

**Key words:** transmission, clutch, moment, dynamic loads, differential motion equations, dynamic transmission model.

At this moment vibrations in a car's transmission are of particular importance due to an increase in travel speeds, engine power, a significant decrease in the mass of parts and the need to increase their reliability.

Vehicle transmission parts along with rotating parts engine, wheels, crankcase parts and the mass of the entire car forms a multi-mass elastic system, which, when the speed changes, comes into oscillatory motion.

The relevance of the study lies in the importance of considering the types of dynamic loads and, therefore, their main functions. It has been established that the study of the maximum dynamic loads in the transmission must be carried out taking into account the elasticity of the parts, since the elasticity significantly affects the value of the maximum dynamic loads and gives them an oscillatory character. Research usually begins with the selection of an equivalent dynamic model of the system. When conducting research, researchers usually face the problem of choosing the correct equivalent dynamic model of the system. The main goal of the work is to analyze the loads depending on the vibration frequency.

With account for the dynamic loads oscillation in the transmission, we assume that for the analysis of loads caused by low-frequency oscillations, it is sufficient to consider a two-mass model, and for calculating loads due to high-frequency oscillations, a four-mass model. This calculated four-mass model also allows for slipping of the driving wheels. The differential equations of motion of the four-mass two-link dynamic model are as follows:

$$\left. \begin{aligned} J_1 \ddot{\varphi}_1 &= M_k - M_{sc}; \\ J_2 \ddot{\varphi}_2 &= M_{sc} - C_{23}(\varphi_2 - \varphi_3) - K_{23}(\dot{\varphi}_2 - \dot{\varphi}_3); \\ J_3 \ddot{\varphi}_3 &= C_{23}(\varphi_2 - \varphi_3) - C_{34}(\varphi_3 - \varphi_4) - K_{34}(\dot{\varphi}_3 - \dot{\varphi}_4) - K_{23}(\dot{\varphi}_2 - \dot{\varphi}_3); \\ J_4 \ddot{\varphi}_4 &= C_{34}(\varphi_3 - \varphi_4) - M_c + K_{34}(\dot{\varphi}_3 - \dot{\varphi}_4) \end{aligned} \right\} \quad (1)$$

where  $J_1$  - reduced moment of inertia of the flywheel and rotating parts of the engine;

$J_2$  - reduced moment of inertia of the clutch disc, gearbox parts and transmission brake drum;

$J_3$  - reduced moment of inertia of the driving wheels with assembled tires, parts of the main gear, differential and semi-axles;

$J_4$  - reduced  $J$  moment of inertia of the car;

$C_{23}$  - reduced rigidity of the universal joint shafts and axle shafts;

$C_{24}$  - reduced tangential stiffness of tires;

$K_{23}, K_{24}$  - damping coefficients of transmission sections;

$\varphi_1, \varphi_2, \varphi_3, \varphi_4$  and  $\dot{\varphi}_1, \dot{\varphi}_2, \dot{\varphi}_3, \dot{\varphi}_4$ , respectively, are angular displacements and angular velocities of the reduced masses;  $\ddot{\varphi}_1, \ddot{\varphi}_2, \ddot{\varphi}_3, \ddot{\varphi}_4$  are angular acceleration of reduced masses;

$M_k$  - engine torque, Nm;

$M_{sc}$  is the moment transmitted by the clutch, Nm;

$M_s$  - moment of resistance to movement, Nm.

Using the system of differential equations (1), researcher V.I. Arnold obtained significant theoretical material on the influence of clutch and transmission parameters on dynamic loads. He

found out that the kinematic characteristic of the clutch friction, as well as the rate of changing the moment transmitted by the clutch, have a significant effect on the dynamic loads [1, p. 742].

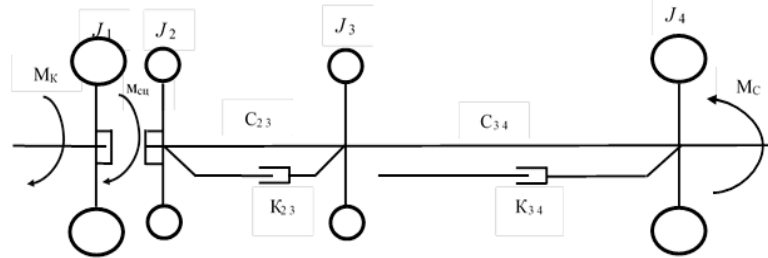


**Figure 1.** Four-mass two-link dynamic model

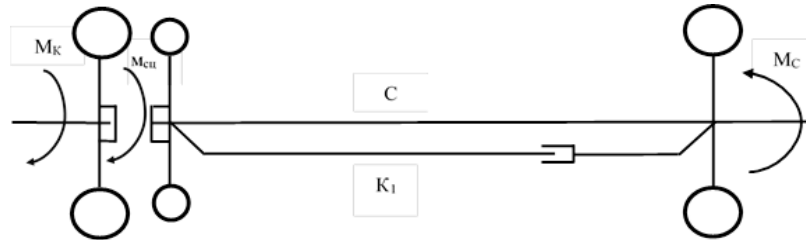


**Figure 2.** Three-mass single-link dynamic model

Values of maximum loads with the clutch engaged determined in the absence of slipping of the driving wheels. Therefore, to study the maximum loads in the transmission, caused only by engaging the clutch, with sufficient accuracy, it is possible to use a three-mass single-link model (Figure 2), especially since it was calculated that the difference in maximum moments in magnitude in the same sections of three and four-mass reduced vehicle transmission systems by no more than 6%. The differential equations of motion of the three-mass, single-link model taking into account will have the form:

$$\left. \begin{aligned} J_1 \ddot{\varphi}_1 &= M_k - M_{cu}; \\ J_2 \ddot{\varphi}_2 &= M_{cu} - C(\dot{\varphi}_2 - \dot{\varphi}_3) - K_d(\varphi_2 - \varphi_3); \\ J_3 \ddot{\varphi}_3 &= C(\dot{\varphi}_2 - \dot{\varphi}_3) - M_c + K_d(\varphi_3 - \varphi_4) \end{aligned} \right\} \quad (2)$$

where  $C$  is the reduced stiffness of the shafts of the cardan gearbox transmission, axle shafts together with tangential stiffness;

$K_d$  is the damping coefficient of the clutch damper and the entire transmission.

The rest of the quantities included in the system of equations (2) are the same as in equations (1).

To solve differential equations (2), it is necessary to set the dependencies:  $M_k = f(t)$ ,  $M_{sc} = f(t)$ ,  $K_d = f(t)$ ,  $M_s = f(t)$ . Taking into account these dependencies, as well as  $K_d = \text{const}$ , we calculate the dynamic loads in the transmission with an engine with  $M_{k\max} = 1040 \text{ Nm}$ ,  $J_1 = 5 \text{ Nm s}^2$ ,  $\omega_0 = 220 \text{ s}^{-1}$ ,  $\omega_{1x} = 80 \text{ s}^{-1}$  when the clutch is engaged at different rates.

To carry out the calculations, an algorithm and a calculation program were compiled using the Runge-Kutta method for the independent variable  $t$ .

Counting step  $0.001 \text{ s}$ , printing step  $0.05 \text{ s}$ . Initial conditions: the engine is instantly brought to the external speed characteristic with  $M_{k\max} = 1040 \text{ Nm}$  while simultaneously engaging the clutch at different rates. Initial data  $t = 0$ ,  $\omega_2 = \omega_3 = 0$  and  $\omega_1 = 200 \text{ s}^{-1}$ ;  $K_1 = 1.04; 4.16; 8.0; 12.0; 16.64 \text{ kNm/s}$ ,  $J_1 = 5 \text{ Nm/s}^2$ ,  $J_2 = 0.6 \text{ Nm/s}^2$ ;  $J_3 = 5; 10; 20 \text{ Nm/s}^2$   $C_d = 1.8 \text{ Nm/s}$ ;  $C = 0.000096 \text{ Nm/deg}$ .

Figure 3 shows the dependence  $\omega_1 = f(t)$ , built for the inclusion of  $K_d = 16.64 \text{ kn.m / s}$ . The calculations for other values of  $K_d$  showed that the fluctuations in the angular speed of rotation of the driven parts of the clutch decreases with a decrease in the rate of engagement of the clutch. Fluctuations in the angular velocity of the links ( $\omega_2$  and  $\omega_3$ ) increase with regard to a decrease in the reduced moment of inertia of the vehicle  $J_3$ . This can only be explained by the amplitude-

frequency characteristic of the system, since in our calculations the value of the adhesion friction force was assumed constant and independent on the sliding speed [4, p.86].

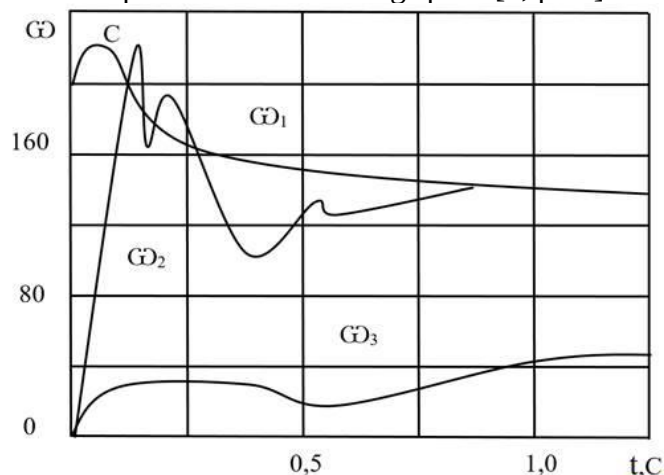


**Figure 3.** Changes in angular velocities with rapid engagement of the clutch

With a constant angular speed of the engine shaft, the maximum angular speed of the driven part of the clutch increases with an increase in the rate of the clutch engagement. At a certain value of the rate of the clutch engagement, the angular velocity of the driven part of the clutch exceeds the angular velocity of the leading part. This leads to a change in the direction of sliding. With an increase in the rate of the clutch engagement, the direction of sliding can change several times, determining the oscillatory nature of the angular velocity. This also changes the maximum value and direction of the torque acting in the transmission units. The growth of dynamic loads in the transmission associated with the engagement of the clutch continues the rate of the clutch moment rising up to a certain value (Figure 4).

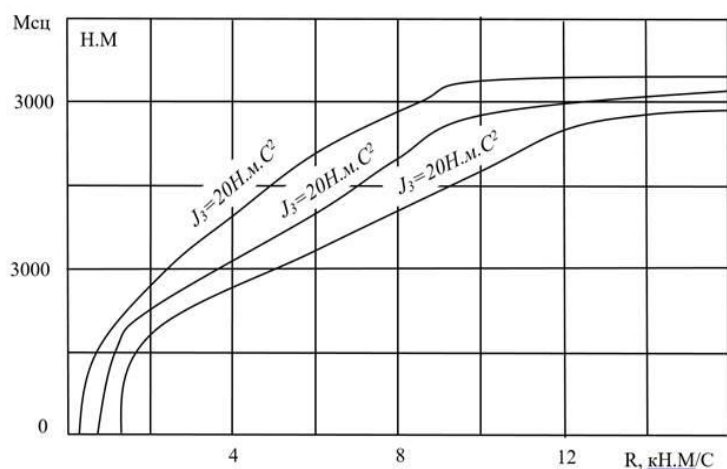


**Figure 4.** Dependence of the maximum moments on the input shaft of the gearbox on the rate of engagement of the clutch

A further increase in the dynamic torque slows down due to the possible slippage of the driving and driven parts of the clutch, since it has been established that the dynamic pressing of the pressure plate, associated with the inertia of the progressively moving parts of the clutch, does not significantly affect the dynamic torque in the transmission.

The increase in the dynamic torque in comparison with the static frictional moment of the clutch friction in our calculations was about 19%, at large values of  $K_1$ , corresponding to the engagement of the clutch by “throw”.

The influence of the reduced moment of inertia of the car  $J_3$  on the formation of maximum dynamic loads in the transmission is manifested in the fact that with an increase in  $J_3$  the maximum dynamic moment reaches a maximum at a lower rate of clutch engagement [3, p.29].

For example, at  $J_3 = 10 \text{ Nm/s}^2$ , the maximum dynamic moment in the transmission reaches at  $K_1 = 12 \text{ kNm/s}$ .

To solve many problems, as the analysis of calculations has shown, it is permissible and expedient to conduct research without taking into account the oscillatory processes determined by the elasticity of the links of the system.

Thus, in order to determine the load of the transmission elements of the car, it is necessary:

1) to discretize the parts or components of the machine unit of the car, i.e. to present the latter in the form of a mechanical torsional oscillatory system consisting of concentrated masses and inertia-free elastic links (to create a mechanical model of the dynamic system of the machine unit of the car);

2) to determine the values of the parameters of the mechanical model of the dynamic system of the machine unit of the car;

3) to make a diagram of the dynamic system of the machine unit to bring the parameters of the mechanical model to one or more shafts (one or more angular velocities at the places of separation of the dynamic system);

5) to make a mathematical model of the mass movement of the calculation scheme of the reduced dynamic system of the car engine unit;

6) to solve the equations of mass motion of the design scheme of the reduced dynamic system of the car's engine unit on computer, i.e. to determine the values of torques in the elastic links of the dynamic system of the machine unit of the car.

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## **ОЦЕНКА ПРОЧНОСТИ ЛОПАСТЕЙ ГРЕБНЫХ ВИНТОВ THE STRENGTH EVALUATION OF PROPELLER BLADES**

**Аннотация.** В работе изучены основные разрушающие факторы, действующие на элементы судового движителя, в том числе, на лопасти гребного винта. Проведен обзор возможных повреждений винта, под действием внешних влияний, при этом учтены факторы, ускоряющие процесс разрушения. Перемещения лопастей при работе винта носят циклический характер, что позволяет применить для исследования их напряженно – деформированного состояния ряды Фурье, в том числе разложение в ряд циклических нагрузок, действующих на судно в целом и на винты в частности. Наложение периодического внешнего воздействия на собственные частоты колебаний лопастей вызывает резонансные эффекты, резко увеличивающие амплитуду напряжений в элементах винта. В работе предложен способ нахождения собственных частот колебаний лопастей путем выделения тригонометрического ряда из степенного, соответствующего решению дифференциального уравнения колебаний. Полученные результаты могут быть использованы для оценки прочности винтов различных конструкций и изготовленных из различных материалов.

**Abstract.** The paper considers the main destructive factors acting on the elements of the ship's propulsion system, including the propeller blades. A review of possible damage to the screw under the influence of external influences due to its structural characteristics and the material of the product is carried out while taking into account the factors that accelerate the destruction process. The movements of the blades during the operation of the screw are cyclical, which allows us to use Fourier series to study their stress – strain state, including the decomposition into a series of cyclic loads acting on the ship as a whole and on the screws in particular. The imposition of a periodic external influence on the natural frequencies of the blade vibrations causes resonant effects that sharply increase the amplitude of the stresses in the screw elements. In this paper, we propose a method for finding the Eigen frequencies of blade vibrations by isolating the trigonometric series from the power series corresponding to the solution of the differential equation of oscillations. The results obtained can be used to evaluate the strength of screws of various designs and made of various materials.

**Ключевые слова:** движитель, лопасти, прочность, собственные частоты, усталость, предел выносливости.

**Key words:** propeller, propeller blades, strength, natural frequency, fatigue, endurance limit.

Currently, most ships use different types of propellers [6]. “Screw propeller is the hydrodynamic device that rotates in a hydrodynamic medium due to a torque (Q) provided by the main engine of the ship” [5]. Due to this rotation, a thrust is produced by the propeller and it is transmitted from the

propeller blades, through the propeller shaft, and at last to the ship's thrust block that transfers the load to the entire ship's hull, which pushes the vessel forward [5].

Screw propellers are the most common model of ship movers – they have high propulsive qualities and are relatively simple in design [7]. These factors provided the development of scientific research aimed at a detailed study of the propeller's hydrodynamics and an increase in their operational reliability [4]. The purpose of the work is to determine the main destructive factors acting on the propeller blades.

Propulsion system was studied by Volker Bertram in "Practical ship hydrodynamics", Robert Latorre, John B. Woodward and Tor Erik Andersen in "Encyclopedia of Physical science and technology", Masaaki Okubo and Takuya Kuwahara in "New Technologies for Emission Control in Marine Diesel Engines".

The propeller belongs to the category of such ship mechanisms, the performance of which depends not only on one of the ships, but also the safety of its navigation.

The propeller operates under conditions when:

- external forces acting on its blades, as a rule, are unsteady in time, while having the effect of an aggressive environment;
- undergoing corrosive destruction, and also the influence of hydrodynamic loads with the occurrence of the phenomenon of cavitations.

All this determines the character of propellers' damage occurring in the operating ships practice of the sea and river fleet [3].

In some cases, corrosion and erosion damage to the propeller provide the bending of the blade edges, which negatively affects the hydrodynamic properties of the propeller, and can cause a blade breakage. Due to insufficient local strength of the propeller blade, bending of the leading edge may occur (Fig. 1). This type of damage is typical for wide-bladed propellers with a disk ratio of 0.9-1.0.

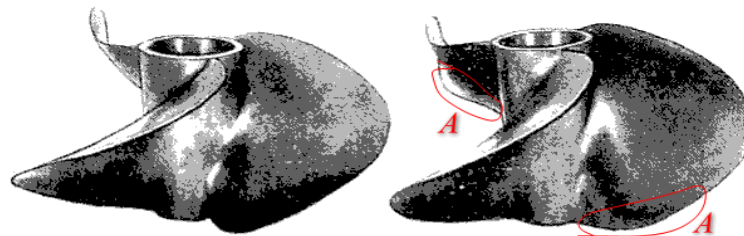


**Figure 1.** Bending of the propeller blade due to the action of hydrodynamic forces

Engineering techniques for the propellers design do not provide reliable recommendations for the uniform strength of its elements over the entire surface. Ensuring the local strength of the blades, as a rule, is carried out by assigning edge thicknesses based on the existing operating experience of previously designed propellers. This compelled technique turns out to be especially unreliable if it is necessary to extrapolate the parameters characterizing its operation for a newly designed propeller, for example, the transmitted power, towards higher values, or if the newly designed propeller is intended to operate in conditions of greater unevenness of the incoming flow.

The greatest danger of creating an emergency is the damage to the propeller, the cause of which is the insufficient overall strength of the blades. Blade breakage occurs, as a rule, in the area of the tensest core sections (Fig. 2). Due to the seriousness of these damage consequences, ensuring the strength of the blades deserves the closest attention of researchers and designers. At the same time, it is possible to indicate faulty technical and operational-economic tasks that necessitate the calculation of the total strength of propellers [1].

The results of the voltage calculation were obtained and that make it possible to take the optimal parameters of the blades, increasing the hydrodynamic efficiency of the propeller with a decrease in the probability of cavitation. At the same time, the reduction in the weight and the propeller's flywheel

moment reduces the load on the stern tube bearing, which makes it possible to avoid work in the speed zone, which is hazardous for torsional vibrations in the speed range.

The operational and economic aspects of the design increase with the improvement of the propulsion characteristics, based on the technical improvement of its design.

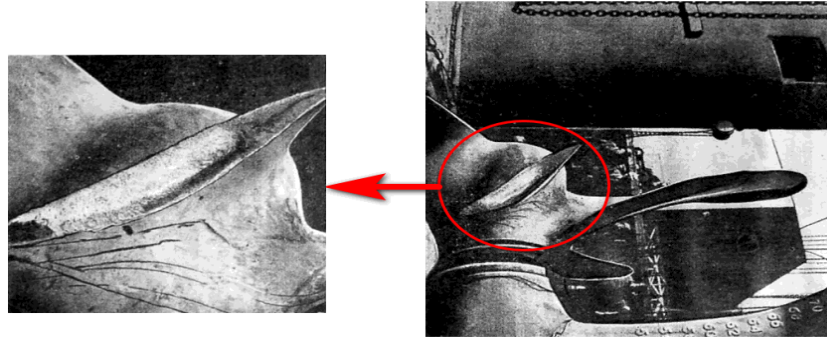


**Figure 2.** Fatigue failure of a large-capacity tanker propeller blade.

The hydrodynamic and inertial (centrifugal) forces that act on the propeller have constant and variable components. Variable loading characteristics, as a rule, are of a cyclic nature, which is caused, in particular, by an uneven velocity field around the propeller disk, due to the hydrodynamic influence of the ship's hull and stern protruding parts. This effect is influenced by the angles of attack of the blade elements that periodically change during the rotation of the propeller.

The load values at certain points in time can differ significantly from its average value over a period of time corresponding to one revolution of the screw. Calculations and experiments show that the amplitudes of the variable component of the hydrodynamic load can reach 50% of the average value of the full load in some cases. Obviously, the average and instantaneous values of the blade tension will be in the same ratio. In the general case, the hydrodynamic load of a blade can be analytically represented in the form of a Fourier series, where the angular coordinate  $\theta$  of the blade in the rotor disk is taken as an argument, and then, with the average value of the blade stop per rotor revolution  $P_0$  and the torque  $M_0$  (constant load components), it has the following ratio:

$$P_1 = P_0 + \sum_{m=1}^{\infty} (P_{mc} \cos m\theta + P_{ms} \sin m\theta) \quad (1)$$

$$M_1 = M_0 + \sum_{m=1}^{\infty} (M_{mc} \cos m\theta + M_{ms} \sin m\theta) \quad (2)$$

The load components  $P_{mc}$ ,  $P_{ms}$ ,  $M_{mc}$ ,  $M_{ms}$  which varying due to the propeller operation in an uneven velocity field behind the ship's hull.

Obviously, the more correct approach to considering the strength of the propeller is one when the cyclic loading of the blades is taken into account while determining the external forces.

An important role in ensuring the operational strength of propellers is also influenced by factors related to the technology of production and repair, as well as the compliance of the mechanical properties of materials. Among these factors, the most significant ones are the perfection of casting techniques, ensuring uniform cooling of castings, measures to relieve tensions arising from the elimination of various blade defects by welding.

In addition to solid propellers, adjustable pitch screws (APS), water jet propellers and ones with removable blades are also widely used. The design features of these types of propellers have a number of special issues concerning, first of all, methods for determining forces and calculating tension in the details of fastening the blades and their rotation drive mechanisms (propellers with removable blades and APS). At the same time, since propellers with removable blades are installed more often on ships

intended for navigation in ice conditions, it becomes necessary to assess external forces in case of possible impacts of the blades on floating ice floes.

### **Tensions in the sections of the propeller blade**

A propeller blade with a conventional design can be represented by a helicoidal shell of variable thickness, rigidly fixed along the inner part of the contour and free along the rest of the boundary.

For the practice of designing propellers, although less rigorous and laborious calculation methods based on various kinds of additional assumptions are acceptable.

The most widely used methods for calculating strength based on the theory of prismatic rods. The components of the hydrodynamic bending moment acting in the section of the ABCD blade are shown in the Figure 3.

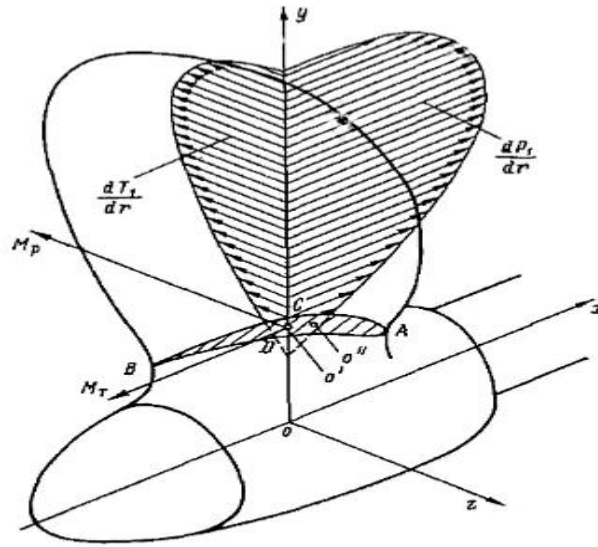


**Figure 3.** Components of the hydrodynamic bending moment acting in the blade section ABCD:

$M_p$  — component from the action of the axial (in the direction of movement of the propeller) of the hydrodynamic load in an arbitrary section of the blade at a distance  $r_p$  from the axis of rotation of the screw;  $M_T$  — component from the action of shear hydrodynamic forces  $dP_1 u$   $dT_1$  — slant and torque of the blade element, respectively

One should consider the section of the blade onto a plane passing through point  $O'$  perpendicular to the axis of the blade  $O_y$  (Fig. 4).

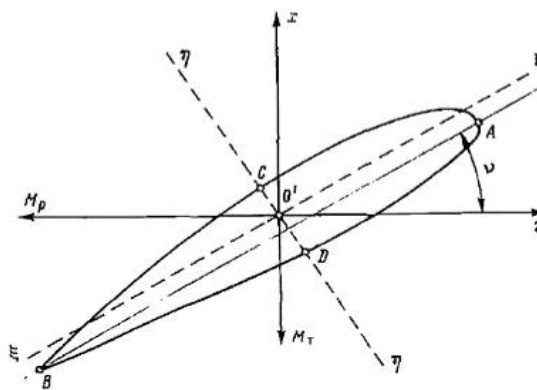


**Figure 4.** Main central axes of the blade section:

$x - x$  axis of minimum rigidity;  $\eta - \eta$  axis of maximum rigidity

Having projected the points on axes  $x - x$  and  $\eta - \eta$  we can get:

– total bending point  $M_\xi$  relatively to  $x - x$  axis taking into account hydrodynamic and centrifugal forces

$$M_\xi = (M_p + M_c) \cos \nu + M_T \sin \nu \quad (3)$$

– point  $M_\eta$  relatively to  $\eta - \eta$  axis

$$M_{\eta} = (M_P + M_C) \sin \nu - M_T \cos \nu \quad (4)$$

In addition to bending moments, the external load of the blade consists of tensile forces arising from the action of centrifugal force  $P_c$ . In the case when the values are set:  $I_{\xi}$ ,  $I_{\eta}$  – points of inertia of the blade section relatively to the central axes  $x-x$  and  $\eta - \eta$ ;  $\xi_{max}$ ,  $\eta_{max}$  – the distance from the most distant section to the neutral axis;  $W_{\xi}(\eta_{max})$ ,  $W_{\eta}(\xi_{max})$  – section resistance for points with coordinates  $\eta_{max}$  and  $\xi_{max}$ , accordingly we can determine bending tension at corresponding points relative to the neutral axis of the blade section; and tensile tension from centrifugal force.

$$\sigma_{\xi}(\eta_{max}) = \frac{M_{\xi} \eta_{max}}{I_{\xi}} = \frac{M_{\xi}}{W_{\xi}(\eta_{max})} \quad (5)$$

$$\sigma_{\eta}(\xi_{max}) = \frac{M_{\eta} \xi_{max}}{I_{\eta}} = \frac{M_{\eta}}{W_{\eta}(\xi_{max})} \quad (6)$$

$$\sigma_c = \frac{P_c}{F} \quad (7)$$

Taking into account the cyclic features of loading, it was found that the greatest tension arises in the core sections of the blade. Without introducing a significant error, it can be taken as a dangerous section at a radius of 0.2.

#### **Proper vibrations of the propeller blade**

In the process of designing structures exposed to periodic forces, it is necessary to calculate the frequencies of proper vibrations in order to take measures to exclude the possibility of their coincidence with the frequencies of the disturbing forces. In this case, the phenomenon of resonance is known to occur, in which even very insignificant disturbing forces can cause significant alternating tension in an oscillating structure and destruct it relatively quickly.

It is advisable to determine the frequency of free oscillations of the blades for all large-sized propellers (with a diameter greater than 4-5 m). This is due to the fact that the frequencies of free oscillations of the blades of such propellers in water are relatively low and with relatively high-speed engines, resonance oscillations may occur.

It has been experimentally established that an aqueous medium approximately halves the natural frequency measured in air. In accordance with this fact, for propellers of transport ships one can accept  $f_{water} \approx 0,5 f_{air}$  [3].

#### **Cyclic loading of the propeller blade**

Experimental studies of the tension state of the blades of propeller models have established that, regardless of their geometric characteristics, the zones of the greatest thickness are the tensest parts of the blades.

One should consider that it is advisable to calculate the strength only for the largest section thicknesses, that is, in the part of the core sections of the blade.

#### **Characteristics of materials for the propeller blades manufacture**

The materials used for the manufacture of propellers must have properties due to the specifics of the operation of the propellers as screws. Taking into account the character of external loads received by the propeller, the materials should be characterized by a high level of static strength and plasticity and at the same time withstand well cyclic loads from unsteady hydrodynamic forces and moments arising from the propeller operating behind the ship's hull (Table 1).

**Table 1.** Corrosion and erosion resistance of propeller materials

| Materials models | Cavitation tests on magnetic striction vibrator | Corrosion tests   |                     |
|------------------|-------------------------------------------------|-------------------|---------------------|
|                  | Weight loss, g/m <sup>2</sup>                   | Spindle apparatus | Variable device dip |

|                  | for 1-st hour<br>of the test | for 2-st hour<br>of the test | for 3-st hour<br>of the test | total<br>(for 3 hours) | weight loss,<br>g/m <sup>2</sup> ·h | corrosion velocity<br>mm /year | weight loss g/m <sup>2</sup> ·h | corrosion velocity<br>mm /year |
|------------------|------------------------------|------------------------------|------------------------------|------------------------|-------------------------------------|--------------------------------|---------------------------------|--------------------------------|
| 25L              | 83,4                         | 105,6                        | 75,4                         | 264,4                  | 0,552                               | 0,615                          | 2,120                           | 2,360                          |
| 1X14ND           | 8,7                          | 14,0                         | 12,0                         | 34,7                   | 0,0028                              | 0,0031                         | 0,0184                          | 0,0206                         |
| 0X17Г4N3D2T      | 13,0                         | 24,0                         | 18,0                         | 55,0                   | 0,0042                              | 0,0047                         | 0,0124                          | 0,0138                         |
| LTsmTs Zh55-3-1  | 42,3                         | 58,3                         | 56,3                         | 157,1                  | 0,0075                              | 0,0080                         | 0,0301                          | 0,0332                         |
| LTsMtsZh67-5-2-2 | 10,3                         | 22,5                         | 23,6                         | 56,4                   | 0,0033                              | 0,0037                         | 0,014                           | 0,016                          |
| Br.AZh9-4-4      | —                            | —                            | —                            | 32                     | 0,0017                              | 0,0020                         | 0,060                           | 0,068                          |
| «Neva»           | —                            | —                            | —                            | 50                     | 0,004                               | 0,0045                         | 0,028                           | 0,032                          |

### Caprolon as a material for propeller blades

Caprolon, like nylon, belongs to the class of polyamides. This synthetic material is a white or cream-colored polymer.

The advantages of caprolon are corrosion resistance, high wear resistance, vibration resistance, sufficient plasticity during running-in, and high antifriction properties. It can be used in a marine environment, in addition, caprolon is much lighter than bronze and steel, its density is only slightly higher than that of water.

Therefore, in some cases, caprolon is used as a material in the manufacture of elements of ship mechanisms.

The data of experimental studies on the cyclic strength of “caprolon B” are presented in the Table 2 [2].

**Table 2.** Limits of endurance of “caprolon B” for different characteristics of the samples

| Characteristics of samples of “caprolon B”               | Moisture content, % | $\sigma_{-1}$ , MPa |
|----------------------------------------------------------|---------------------|---------------------|
| With a large fillet (radius 10 mm)                       | <0,2                | 27                  |
| With a small fillet (radius 0,8 mm)                      | <0,2                | 27                  |
| With slots (radius 1 mm)                                 | <0,2                | 27                  |
| Heat treated<br>with a small fillet (radius 0,8 mm)      | <0,2                | 36                  |
| Aged in sea water<br>with a small fillet (radius 0,8 mm) | 6,0                 | 14                  |

It can be seen that caprolon not only has a low specific gravity, but also it has good strength properties. Thus, it can be successfully used for the manufacture of very light weight propeller blades.

Thus, the paper considers the main destructive factors acting on the elements of the ship's propulsion unit, including the propeller blades. A review of possible damage to the screw under the influence of external influences is carried out, taking into account the factors that accelerate the process of destruction. It has been established that the displacements of the blades during the operation of the propeller are of a cyclic character, which makes it possible to use Fourier series to study their stress-strain state, including the expansion into a series of cyclic loads acting on the ship as a whole and on the propellers in particular.

It is shown that the calculation of the strength must be performed taking into account the indicators of the durability of their materials with a cyclic load on the propulsion elements of a ship. In this case, it is necessary to have the characteristics of the operating modes of loading.

The necessity of determining the frequencies of free oscillations of the blades has been established, which is important for large-sized propellers (with a diameter greater than 4-5 m). The analysis of the possibility of using various types of structural materials for the manufacture of propeller blades was made.

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**РАЗВИТИЕ СИСТЕМЫ ФИНАНСОВОГО МОНИТОРИНГА  
В РОССИЙСКОЙ ФЕДЕРАЦИИ  
DEVELOPMENT OF THE FINANCIAL MONITORING SYSTEM  
IN THE RUSSIAN FEDERATION**

**Аннотация.** В данной статье рассматривается развитие системы финансового мониторинга в Российской Федерации. Цель данной работы является исследование финансового мониторинга в период его становления. В настоящее время деятельность финансового мониторинга является одной из важных составляющих системы Российской Федерации, поэтому данная проблема является актуальной. В работе были рассмотрены основные этапы становления финансового мониторинга в РФ на пути к качественной и надежной финансовой разведки, в целях противодействия и легализации (отмыванию) доходов, полученных преступным путем, и финансированию терроризма. В процессе исследования выявлено, что в России была проделана колоссальная работа для противодействия незаконным финансовым операциям.

**Abstract.** This article is devoted to the development of the financial monitoring system in the Russian Federation. The purpose of this work is to study financial monitoring during its formation. Currently, the activity of financial monitoring is one of the important components of the system of the Russian Federation, therefore, this problem is relevant. The paper considered the main stages of the formation of the financial monitoring in Russian Federation on the way to high-quality and reliable financial intelligence, in order to counteract and legalize (laundering) of proceeds from crime and the financing of terrorism. In the course of the study, it was revealed that a tremendous amount of work has been done in Russia to counter illegal financial transactions.

**Ключевые слова:** финансовые операции, хищение денежных средств, легализация доходов, криминогенная обстановка, Федеральная служба по финансовому мониторингу.

**Key words:** financial transactions, embezzlement of funds, legalization of income, crime situation, Federal Financial Monitoring Service.

The Federal Financial Monitoring Service was established in 2001 by Decree of the President of the Russian Federation No. 1263 dated 01.11.2001 "On the authorized body for countering the legalization (laundering) of proceeds from crime and the financing of terrorism" [3, p. 115]. In 2021, Rosfinmonitoring is twenty years old. We can confidently say that during this time period the state has experienced and overcome a number of difficulties and obstacles. The formation of economic relations and the development of technological progress are only a small part, thanks to which the risk of money laundering and embezzlement increases. The use of legalized income leads to the oppression of the financial and economic activities of the state, as well as provokes the material base for terrorist, corruption and criminal activities. In order to counter these threats, the state was forced



to form an executive authority that oversees the monetary transactions of individuals and legal entities to identify suspicious transactions.

Elements of the Russian system of countering the legalization (laundering) of income began their formation back in 1994. Then, the overall crime rate doubled and became more organized and professional. The crime situation in the country flourished and sought to penetrate into the political and economic sphere of the state.

In 1994, a program on measures to combat corrupt crime was approved. The purpose of this program was to ensure the safety and protection of life, health and any other rights of citizens, as well as to protect state interests.

Such laws as: "On responsibility for the legalization of criminal proceeds"; "On combating organized crime"; "On combating corruption", etc. acted as priority measures to combat crime [2, p.85].

Thus, the foundations were formed to create a state body for the supervision of criminal proceeds and countering their legalization.

For the Russian Federation, 1997 became one of the landmark years, as it joined and became a full member of the Council of Europe's Committee of Experts on the Evaluation of Anti-Money Laundering Measures (MANIVEL). MANIVEL is a FATF-type regional group whose main task is to introduce interstate standards aimed at combating money laundering in Europe.

The signing of the Strasbourg Convention of the Council of Europe "On Laundering, Detection, Seizure and Confiscation of Proceeds from Criminal Activity" in 1990 also allowed the Russian Federation to improve in the field of AML/CFT and reach a new level of combating this crime.

On the territory of the Russian Federation, in 1999, an Interdepartmental Center for Countering the legalization (Laundering) of Illegally Obtained Income was established under the Ministry of Internal Affairs of the Russian Federation. It included the representatives of Ministry of Finance of Russia, the FSB of Russia, the Ministry of Internal Affairs of Russia, the FSNP of Russia, the Ministry of Internal Affairs of Russia, the Ministry of Economy of Russia, the State Customs Committee of Russia and the VEK of Russia [1, p. 35].

The year 2000 was a cancer year for the Russian Federation in the field of financial monitoring development, as according to the results and analytical conclusion of international experts. Moreover, it did not pass the verification of compliance with the standards of legislation in the field of combating money laundering and, by the decision of the commission, was included in the FATF blacklist.

After being included in the "black list", the Russian Federation became more actively engaged in bringing legislation into compliance with the norms established by the FATF. And the most important document, which guides all structures currently in the Russian Federation related to AML/CFT, was adopted on August 7, 2001, Federal Law No. 115-FZ "On Countering the legalization (laundering) of proceeds from crime", as well as Federal Law No. 121-FZ "On Amendments and additions to Legislative Acts of the Russian Federation in connection with the adoption of the Federal Law" On Countering the Legalization (Laundering) of proceeds from crime".

In general, during this period of time, a legislative framework was formed, the purpose of which was to combat money laundering and terrorist financing.

The legal basis for creating an effective and operational system for preventing the legalization (laundering) of criminal proceeds, organizing anti-money laundering processes, as well as the participation of the Russian Federation in international cooperation in this area, was laid by Federal Law No. 115, and it is also a "strong foundation" of the entire AML/CFT system.

Thus, gradually bringing the legislative base of the Russian Federation into compliance with the FATF standards, by February 1, 2002 (i.e. the date of entry into force of No. 115-FZ), legally correct, legal and organizational prerequisites were developed and created, which allowed the national AML/CFT system and its core as a whole to begin to function stably [4, p. 45].

In conclusion it can be noted that a lot of work has been done in Russia to counter illegal financial transactions. The development of the most important anti-washing system now can be managed. At this time stage, Russia and financial intelligence are also facing new large-scale tasks

and problems that need to be solved. But since Rosfinmonitoring is currently a huge structure that has all the capabilities and means to prevent and prejudice any illegal AML/CFT activity, then it can ensure our country's national security.

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### **УПРАВЛЕНИЕ ЭЛЕКТРОПРИВОДАМИ СОЧЛЕНЕНИЙ МНОГОЗВЕННОГО МАНИПУЛЯТОРА РОБОТОТЕХНИЧЕСКОГО КОМПЛЕКСА ELECTRIC JOINT MODULES CONTROL OF A MULTI-LINK ROBOTIC SYSTEM**

**Аннотация.** Исследования, представленные в данной работе, связаны с задачей приведения конечного эффектора (центра схвата) антропоморфного манипулятора подводного аппарата в заданное положение за заданное время с помощью метода конечного состояния. Поставлена задача исследовать алгоритм управления с учетом программной среды реализации. Вся работа по созданию системы моделирования управления манипулятором с учетом динамики приводов была разбита на три этапа. На первом этапе разработан алгоритм вычисления управления в виде напряжений. На втором этапе разработанный алгоритм запрограммирован в визуальной среде xCos. На третьем, заключительном этапе, проведено исследование работоспособности обновленной схемы. На основании проведенных

компьютерных экспериментов можно сделать вывод, что выбранный метод управления работоспособен и позволяет достичь высокой точности позиционирования конечного эффектора манипулятора.

**Abstract.** The studies presented in this paper are related to the task of bringing the end effector (grip center) of an anthropomorphic manipulator of an underwater vehicle to a given position within a given time using the final state method. The task is to investigate the control algorithm taking into account the software implementation environment. All work on creating a system for simulating manipulator control taking into account the dynamics of drives was divided into three stages. At the first stage, an algorithm for calculating control in the form of stresses is developed. At the second stage, the developed algorithm is programmed in the xCos visual environment. At the third, final stage, a study of the functionality of the updated circuit was carried out. Based on the computer experiments carried out, it can be concluded that the selected control method is efficient and allows achieving high positioning accuracy of the manipulator end effector.

**Ключевые слова:** двигатель постоянного тока (ДПТ), метод конечных состояний (МКС), многозвенный манипулятор, среда xCos, управления в виде напряжений, симуляция.

**Key words:** direct current motors (DCM), finite state method (FSM), multi-link manipulator, xCos environment, control in the form of voltages, simulation.

The research results presented in this work are related to the task of bringing the end effector (grip center) of an anthropomorphic manipulator of an underwater vehicle to a given position within a given time using the final state method [3]. The task is to investigate the control algorithm taking into account the software implementation environment.

The solution to the problem of driving ginge drives by direct current motors (DCM) [2] is considered. The control will be calculated in the form of voltages applied to the DCT armature. The main physical relations are given for solving the problem of calculating control voltages [1]. The main difficulty here is the development of algorithms for calculating the angular acceleration of the drives in terms of variables used in the finite state method in an explicit form.

It is shown that the controls for DCM are calculated by the formula (1):

$$U_i = \frac{1}{k_{di}} \left( J_i(u_1) \frac{\partial u_i}{\partial t} + k_{ci} u_i \right), \quad (1)$$

where  $J_i$  – is a reduced moment of inertia of the  $i$ -th pair,  $\left. \begin{matrix} k_{di} \\ k_{ci} \end{matrix} \right\}$  – design parameters,  $u_i$  – angular speed of motors,  $\frac{\partial u_i}{\partial t}$  – angular acceleration of manipulator links, which can be measured, or, in the absence of appropriate meters, found by the formula:

$$\frac{\partial u}{\partial t} = \left( \frac{\partial G^+}{\partial \theta} \frac{J^* - J}{Tm} - G^+ \frac{1}{Tm} G^T \right) u, \quad (2)$$

where  $\theta_i$  are defined below and  $Tm$  is the adjustment parameter.

In accordance with the two-stage process of using the finite state method (FSM) to control the DCT, a dynamic model of the robot is used:

$$\begin{aligned} \frac{d\theta_i(t)}{dt} &= u_i, i = 0, \dots, 5, \\ t &\in [t_0, t_f], \theta_i(t_0) = \theta_i^0, \end{aligned}$$

where  $\theta_i$  – angles of rotation of the joints (there are six of them) of the robot,  $u_i$  – control actions in the form of angular accelerations. The angular accelerations are state variables of the DCT drives with a simplified model (1). With the help of the FSM,  $u_i$  can be easily calculated, which is due to the independence of the right-hand sides of the robot's equations from the state  $\theta_i$ . In the calculations of  $u_i$ , we used the formulas shown in the program text given in [3] (function mks). In formula (2), the notation  $J$  is used for the criterion for the approximation of the final values of the angles of rotation to the given values of  $J^*$  and matrices  $G, G^+$  (see the text of the mks function in [3]). The derivative is calculated by the formula:

$$\frac{\partial G^+}{\partial u_1} = \frac{\partial \left( \frac{G}{\phi} \right)}{\partial u_1} = \frac{\phi \frac{\partial G}{\partial u_1} - \frac{\partial \phi}{\partial u_1} G}{\phi^2}, \quad (3)$$

where  $\phi$  is a scalar function equal to  $G^T G$ .

As a result of calculations, the control of the system will be obtained in the form of voltages supplied to the armature of the DCT system.

To study the behavior of the manipulator, based on the computational algorithms obtained above, a diagram was developed in the xCos SciLab simulation environment, shown in Figure 1:

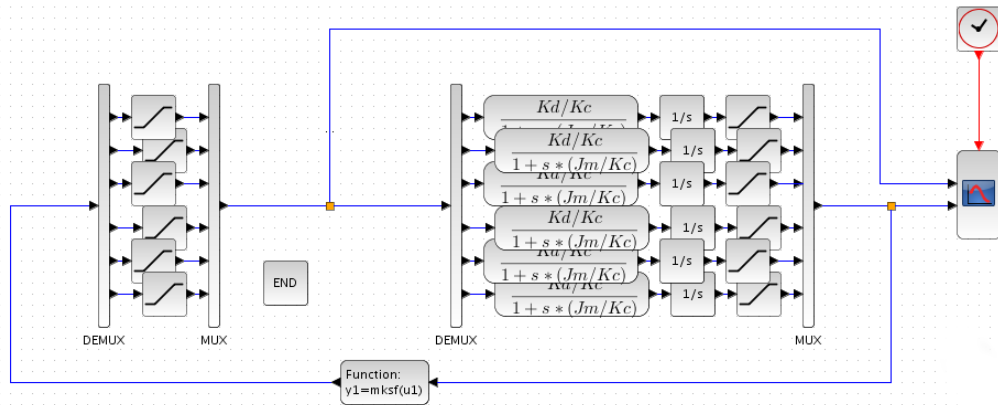


**Figure 1.** Block diagram of visual simulation of manipulator control taking into account the dynamics of drives

DC motors correspond in the diagram to series-connected aperiodic links of the first order, an integrating link and a limiting block for each link of the manipulator. Separation of the transfer function of DCM into two blocks (aperiodic and integrating links) is caused by the fact that the initial position of the link in the xCos modeling environment can be set only in the integrating link. The design parameters of the motor of each link can be set in the definitions of the aperiodic link. Restrictions on the angle of the positions of each link are specified in the blocks of restrictions.

The voltages  $U_i$  supplied to the DCT rotors are calculated in the block indicated in the diagram as  $function: y1 = mksf(u1)$ , where  $y1$  is the vector of the calculated voltages, and  $u1$  is the vector of the position angles  $\phi$ . The vector of the manipulator position angles is fed to the input of the block, and the DCT voltage vector is obtained at the output. If it is necessary to limit the voltage values, the limits are set in the blocks of limits.

To study the operability of the xCos-control scheme for an anthropomorphic manipulator, the position with the parametric coordinates of one of the test points  $T7$  was taken as the end point, the first three columns (without the last zero elements) of which set the orientation of the robot's gripper, and the last column (without the last unit element) – the final gripper position in meters:

$$T7 = \begin{bmatrix} -0.0933 & -0.9616 & 0.2581 & 0.7265 \\ 0.9728 & -0.1432 & -0.1819 & -0.0822 \\ 0.2119 & 0.2341 & 0.9488 & -0.6157 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

The influence of the design parameters of the DCT on the quality of control is shown next.

The process is influenced by the transfer ratio  $Kdv = \frac{Kd}{Kc}$  of the motor and the time constant  $Tm = \frac{Jm}{Kc}$

As a result, graphs of changes in time of the angles of position and angular velocities of the manipulator links are displayed when using control with the method of final states. All graphs have the following color matching: *link 0* – blue, *link 1* – green, *link 2* – blue, *link 3* – red, *link 4* – purple, *link 5* – black.

Below are the graphs of the dependences  $y1(t) = \theta_i(t), i = 0, \dots, 5$  and  $U_i(t)$  obtained for different values of the DCT parameters and the control algorithm.

Considering control at  $Jm = 2$ ,  $Kc = 20$ ,  $Kd = 40$ . That is,  $Kdv = 2$ ,  $Tm = 0.1$ . Control time  $tf = 15$ . The result is shown in Figure 2:

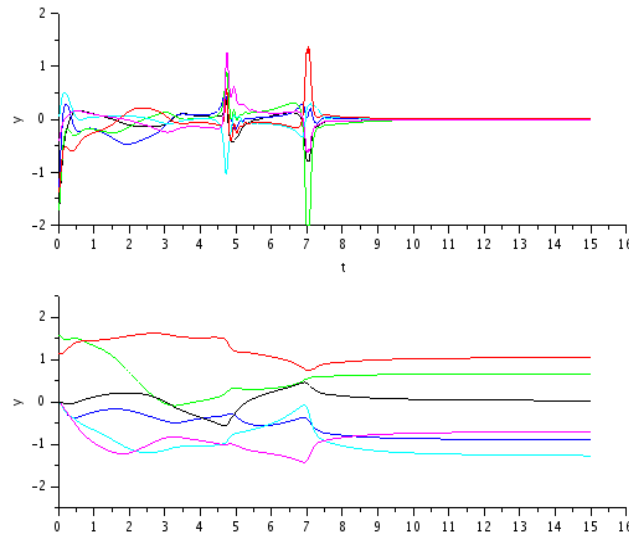


**Figure 2.** Graph of  $y1(t)$ ,  $U(t)$  at  $Tm = 0.1$

The graphs show that the process reaches its goal approximately on the tenth second of control. The control has several impulse emissions during the process. But the ultimate goal was achieved, although for a long period of time.

In the next experiment, we will decrease the value of the time constant by decreasing the moment of inertia  $Jm$ . Initial values of variables:  $Jm = 1$ ,  $Kc = 20$ ,  $Kd = 40$ ,  $Tm = 0.05$ ,  $Kdv = 2$ ,  $tf = 3$ . The result is shown in Figure 3:

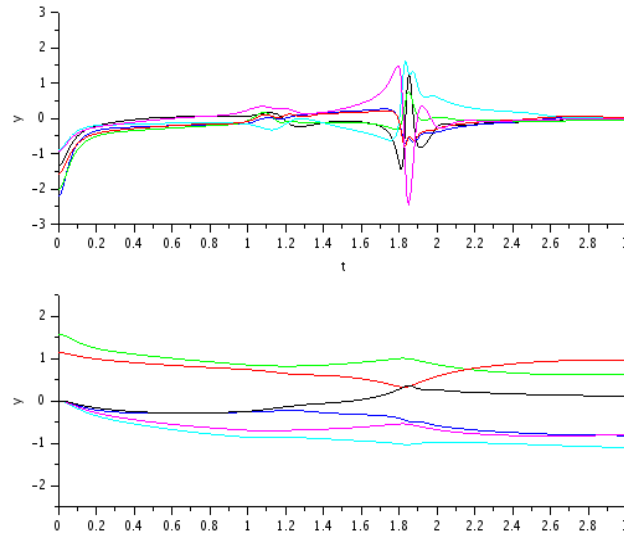


**Figure 3.** Graph of  $y1(t)$ ,  $U(t)$  at  $Tm = 0.05$

Control reaches its goal by the third second of the process. The control has a smooth character with one “surge” of voltages, after which the coordinates of the angles reach the preset values. Compared to previous experiment, the quality of control is noticeably better, and the time to achieve the goal is shorter.

Experiment number 3. The time constant  $Tm$  is also decreased, and the values of  $Kd$  and  $Kc$  are changed. Initial values of variables:  $Jm = 1$ ,  $Kc = 100$ ,  $Kd = 200$ ,  $Tm = 0.01$ ,  $Kdv = 2$ ,  $tf = 2$ . The result is shown in Figure 4:

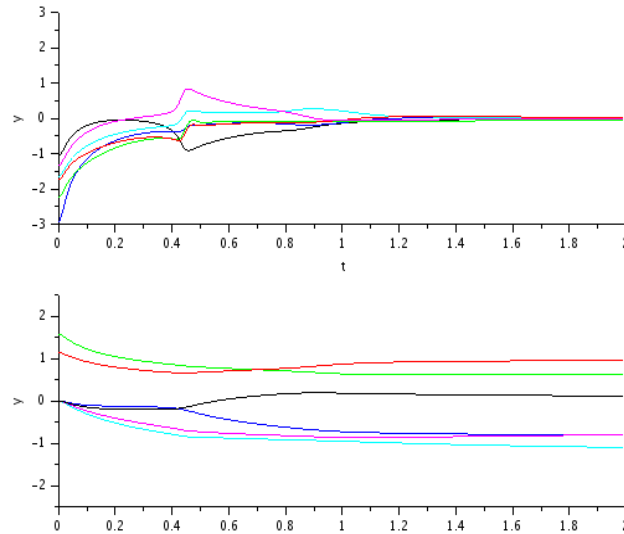


**Figure 4.** Graph of  $y1(t)$ ,  $U(t)$  at  $Tm = 0.01$ ,  $Kdv = 2$

The control reaches the target in one and a half seconds. The control has a continuous character without separate emissions in time. The quality of control has improved further. The time to reach the goal has also decreased.

Experiment number 4. With the same time constant  $Tm$ , the motor transmission ratio is increased. Initial values of variables:  $Jm = 1$ ,  $Kc = 100$ ,  $Kd = 200$ ,  $Tm = 0.01$ ,  $Kdv = 2$ ,  $tf = 2$ . The result is shown in Figure 5:

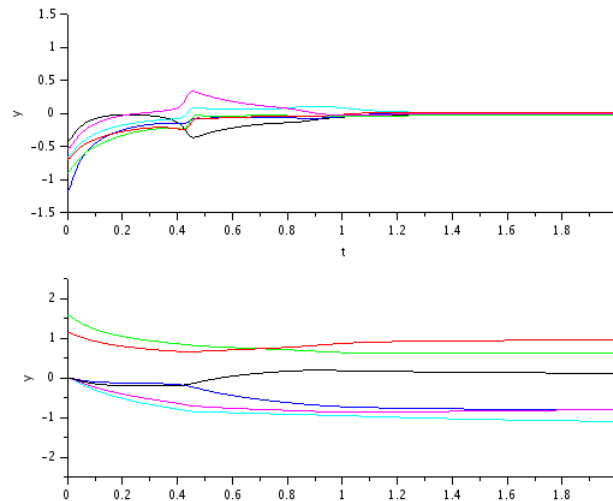


**Figure 5.** Graph of  $y_1(t)$ ,  $U(t)$  at  $T_m = 0.01$ ,  $K_{dv} = 2$

The picture of the process is completely similar to the previous experiment. An increase in the engine transfer ratio affects only the magnitude of the voltages supplied to the DCT rotors.

Based on the performed computer experiments, it can be concluded that the selected control method is efficient and allows achieving high positioning accuracy of the manipulator end effector.

The developed algorithms make it possible to obtain the DCT control of the manipulator links immediately in the form of voltages supplied to the motor rotors. For good results it is necessary to reduce the load on the motors. This leads to a decrease in the reduced moment of inertia and, as a consequence, to a decrease in the mechanical time constant of the motor, which smooths out transients and reduces the time to reach the goal.

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## **АВТОМАТИЗАЦИЯ В МЕДИЦИНЕ AUTOMATION IN MEDICINE**

**Аннотация.** В статье рассматриваются вопросы автоматизации в медицине. В частности, рассматривается автоматизация медицинских данных и информационных систем. В статье пять основных уровней автоматизации медицинских информационных систем выделено. Обсуждаются методы, используемые в обработке изображений. Большое внимание уделяется нейронным сетям, которые являются особым случаем методов распознавания образов. Кроме того, анализируется автоматизация медицинского оборудования, включающая автоматизацию системы управления подачей медицинских газов, интеллектуальные датчики и другие. Сделан вывод, что автоматизация оптимизирует потребление ресурсов и времени, снижает нагрузку на медицинский персонал и увеличивает производительность.

**Abstract.** The article deals with the issues of automation in medicine. Particularly, the automation of medical data and information systems are considered. In the article five main levels of automation of medical information systems are distinguished. The methods used in image processing are discussed. Much attention is given to neural networks which is a special case of pattern recognition methods. In addition, automation of medical equipment is analyzed. It includes automation of the control system for the supply of medical gases, smart sensors, and others. It is concluded that automation optimizes resource consumption and time, reduces the burden on medical personnel, and increases productivity.

**Ключевые слова:** автоматизация, информационная система, медицинские данные, рентгенография, нейронная сеть.

**Key words:** automation, information system, medical data, radiography, neural network.

As we all know the number of automated items is growing every day. Automation makes our life clearer and more convenient. Often, things that are familiar to us perform actions that previously required much more effort. Automation exists to simplify and reduce energy costs. For example, quite recently, in order to make coffee for yourself, it was necessary to pour ground coffee beans into a saucepan, put it on the stove, and then make sure that the coffee did not pour out on the stove when boiling! Now everything is much more convenient: press the button and everything is ready. The same process occurs in all branches of technology: at the household level, in production lines, in mechanical engineering, and even in medicine. Automation in medicine occurs in several directions: in the accounting, storage, use of medical data; in the design of medical devices; in the analysis of the received medical data (CT scans, X-ray images). In this article we will closely look at examples and directions of automation in medicine.

To begin with, let's consider the automation of medical data and information systems. Modern medical information systems are subjected to interaction with an incredibly large amount of all kinds



of data. The quality of services provided in the field of healthcare depends on the effectiveness of this data usage by doctors, their managers, and managing departments. The need to utilize a very large-scale data flow, which is constantly increasing due to factors such as diagnostics, statistics, management decisions, therapy, and so on, today confirms the creation of automated information systems in medical institutions. Some time ago, the Russian healthcare system had virtually no bright signs of automation. Such document flow as: medical outpatient cards, extracts, analyses, conclusions, reports, patient records, etc. were carried out entirely manually by the employees of medical institutions on paper. In turn, this greatly slowed down the process of patient care, mistakes were made, a lot of time was spent on filling out medical records and compiling reports, which together greatly affected the quality of healthcare in general. All these factors caused the quick and qualitative work of the regulatory authorities [1].

In this article five main levels of automation of medical information systems are distinguished.

On the first level there are medical records, upgraded through automation. This level is described by the fact that only about half of the information about the patient is entered into the information system, and then can be issued to the attending physician in the form of various reports and forms. This information system can be called a kind of automated environment of paper technology for patient admission. These automated systems are mostly applied to patient registration, discharge sheets, transformations inside the hospital, maintaining diagnostic data, doctors' appointments, results of operations, etc.

The second level of medical information systems is an automated recording system. At this level, there is: indexing, scanning, and memorization in a system that stores images in electronic form of those documents that were not entered into the database earlier (meaning mainly data obtained from diagnostic devices in the form of various forms, etc.). Such technologies have been successfully used since about 1993.

At the third level of medical information systems development, the introduction of so-called electronic medical records begins. For the application of this technology, it is necessary to develop the infrastructure of the medical institution properly so that it can provide the ability to store and process data directly from the workplace of the attending physician. They must be identified using a system granting certain access rights. It is assumed that at this level of system development, electronic recording may be more important in decision-making and cooperation with expert systems, when a doctor makes a diagnosis, indicates the necessary prescriptions, and so on.

The fourth level of medical information systems is called the electronic medical records system, where patient data can have more information sources. It contains all the basic data about each patient, which may have different sources, that is, different medical institutions.

The fifth level of development of medical information systems carries the name electronic health record. This level differs from the previous one in the existence of an almost unlimited number of data sources about the patient. There is an emergence of various kinds of data from other fields of medicine, behavioral activity, and so on [4].

Furthermore, it is worth mentioning the automation of the main medical work – the evaluation of the patient diagnostic indicators. For example, we will look at how an X-ray analysis is carried out not by doctors, but with the help of machine vision. Radiography is the study of the internal structure of projected objects using electromagnetic rays of a certain spectrum on a special film, paper or digitally registered. As a result, an image appears on an X-ray sensitive film with its subsequent development. Currently, there are also systems providing data registration in digital form. Machine vision is engaged in analyzing the resulting image, and it does this with the help of neural networks. From the point of view of machine learning, a neural network is a special case of pattern recognition methods, discriminant analysis, clustering methods, etc. Here are some of the methods used in image processing methods:

- Pixel counter – counts the number of light or dark pixels;
- Binarization – converts an image in gray tones to binary (white and black pixels);
- Segmentation – used for searching and/or counting parts;

- Blob search and analysis – checks the image for individual blobs of connected pixels (for example, a black hole on a gray object) in the form of image reference points. These blobs often represent targets for processing, capture, or manufacturing defects;
- Reliable pattern recognition – searches by pattern an object that can be rotated, partially hidden by another object, or different in size;
- Barcode reading – decodes 1D and 2D codes designed to be read or scanned by machines;
- Optical character recognition – automated reading of text, for example, serial numbers;
- Measurement – estimates the size of objects in inches or millimeters;
- Edge detection – finds the edges of objects;
- Pattern matching – search, selection, and/or counting of specific models [2].

In most cases, machine vision systems use a consistent combination of these processing methods to perform a complete inspection.

However, for the neural networks implementation to be effective, a specific environment is necessary. It allows to store and mark up data, train and publish networks, and interact with trained networks and users.

The ecosystem of most such neural networks comprises the following parts:

- Data collection and depersonalization service which allows you to carry out the result of the analysis, and connect the patient to a web service. It also permits to configure the fields and parameters of depersonalization. Depending on the file storage, the service collects data of the required modality, cleans the necessary tags in the client contour and transfers the data to the storage.
- Data markup service which is necessary in order to create graphical and textual markup based on graphical data. The marking is made on the basis of the medical protocol of the description of the study. In the service, one can implement and configure protocols depending on the task. The service allows to mark up several groups of specialists at the same time, without crossing their information data.
- Data storage which allows you to securely store data obtained from different sources and used by different elements and users of the platform.
- Network development service which lets us create networks of different architectures, monitor training on different repositories, and manage training parameters. The manual quality control mode is implemented, which allows to determine a control set of data for subsequent analysis of the results by an expert doctor.
- Neural network training scheme in which the knowledge and experience of radiologists is used. The main priority in training networks is to eliminate the possibility of false-positive diagnosis and reduce the errors of false identification of pathology. When training networks, both the full study and its parts are used, in which the pathology is most expressed. It allows to bring the network's work closer to how the doctor perceives the study. One of the key factors in network training is the quality of data markup. As practice has shown, different doctors can see different pathologies in the same study, which can lead to poor-quality markup. To prepare the highest quality data set, the following steps should be considered: firstly, one study is always marked up by several doctors; secondly, in case of discrepancies in key markup parameters, for example, diagnosis, a consultation is held on occasion to form a final conclusion. The most difficult from the point of view of implementation, but the most optimal from the point of view of the result is the approach when the markup is done on a database confirmed by a clinical diagnosis. Thus, the doctor is not looking for pathology, but indicates its localization and conducts a description.

For example, at the first stage of designing each network, well-known neural network architectures are used, which have proven themselves in solving classification problems of both images of the surrounding world and medical research. Fully connected ensembles of layers at the upper level, the methodology of using ensembles changes at the discretion of the developer. After the design stage, the networks are rewritten to their own solution.

This method of analysis solves some problems of modern medicine:

1. X-ray examination is an incredibly resource-intensive area. Preparation of the study description by the system saves the doctor's time. After studying the data, the doctors must formulate

and describe everything they see, including describing all the pathologies detected. Description and formalization of the study results usually takes longer than the study itself.

2. Medical errors are currently considered, along with cardiovascular and oncological diseases, as the leading cause of morbidity and mortality in the world. The accuracy of the conclusion of the diagnosticians is up to 70%, this is due to the human factor, and perhaps to the very possibility of the human eye to accurately determine the nuances of gray in the images. The neural network is already able to conduct screenings with an accuracy of 84%, it is more likely to give a false positive result than to miss the pathology. The accuracy of determining specific pathologies is now at the level of 80 to 99%. And, as already indicated, the accuracy of the network is growing, but already now it works 10–29% more accurately than the average doctor, which means that it will help to increase the accuracy of the work of specialists.

3. The shortage of professional radiologists in the world is recognized, which leads to restrictions in obtaining high-quality and timely diagnostics. The shortage of professional radiologists results in limitations in obtaining high-quality and timely diagnostics. This method of analysis does not increase the number of radiologists, but seriously increases their efficiency [3].

Moreover, automation of medical equipment includes automation of the control system for the supply of medical gases, ward alarms, cleanliness maintenance systems, uninterruptible power supply systems for life support equipment, etc. Medical gas supply systems ensure the delivery of carbon dioxide, helium, nitrogen and other gases for medical purposes. These gases are used, for example, during surgical intervention (nitrogen and anesthesia). Smart sensors monitor the required pressure, temperature and other parameters of gases, their available residue. Automation of systems ensures the stability of equipment operation, as well as increases efficiency while reducing maintenance costs and resources. Maintenance costs are decreased due to the most efficient use at a sufficient power level.

So, in conclusion, automation reduces and optimizes resource consumption, reduces the burden on medical personnel, optimizes time, releases from routine tasks and increases productivity. Automation in medicine is a complex and lengthy process, but definitely worthwhile. After optimizing the work of medical institutions, there is insurance for patients and clinic work from many problems, such as: lack of control or its excess, late reporting, violations of discipline and others that globally affect the work.

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**ПРЕИМУЩЕСТВА И НЕДОСТАТКИ ИСПОЛЬЗОВАНИЯ  
ВОДЯНОГО ТЕПЛОГО ПОЛА В СОВРЕМЕННОМ ДИЗАЙНЕ ИНТЕРЬЕРА  
PROS AND CONS OF UNDERFLOOR HEATING SYSTEM IN  
THE MODERN INTERIOR DESIGN**

**Аннотация.** Статья посвящена актуальной на сегодняшний день теме в дизайне интерьера – системе «водяной теплый пол». Цель исследования – рассказать, что представляет собой тёплый пол, сравнить отопление при помощи теплого пола с другими видами отопления помещений. Теплый пол не создает конвекции, поэтому не создает циркуляции пыли, греет равномерно и прогревает воздух до идеального, с точки зрения комфорта и самочувствия, распределения температуры, о котором подробнее написано в статье. Более того, упоминаются также многие другие положительные моменты системы тёплого пола: гигиеничность, безопасность, саморегуляция, удобство, современность, экономичность и долгий срок службы.

**Abstract.** The article is devoted to the relevant theme in the interior design, that is “water heat-insulated floor” system. Our study aims to show what underfloor heating is, to compare different types of heating with this system. The warm floor does not create convection; therefore, it does not create dust circulation. It heats evenly and warms up the air to the ideal, in terms of comfort and well-being, temperature distribution, which is described in more detail in the article. Moreover, many other

advantages of this system are mentioned: hygiene, safety, self-regulation, convenience, modernity, economy and long service life.

**Ключевые слова:** тёплый пол, отопление, радиатор, дизайн, система, установка.

**Key words:** warm floor, heating, radiator, design, system, installation.

Every person needs comfort at home. One of the main comfort factors is the room temperature. A person should be neither hot nor cold. He should be comfortable. To provide it, a warm floor was created. It heats the room from the bottom up. Underfloor heating is very popular nowadays. Many people have heard about them, someone is thinking of installing them in their home, someone has already installed them. But not everyone knows whereby exactly the water underfloor heating system has won such trust. There are many rumors about this system too, which for the most part is not true. Among other things, designers, planners and the customers themselves may know what is bad or good about the underfloor heating, but they do not know the conditions and nuances of their installation. This leads either to quarrels with the foremen or to a poor-quality project. The purpose of this scientific article is to investigate the phenomenon of warm floor. Also, we tried to pay attention to its positive and negative aspects.

What is underfloor heating? In the classical form, the “water underfloor heating” [3] system is a concrete slab with heating pipes built into it [1, p. 4]. Pipes lie in a serpentine shape. It is important that the bends of pipes have a certain permitted radius, each type of pipe has its own. It isn’t slowed to make a bend less than this radius. Otherwise the pipe may quickly become unusable or air bubbles will appear inside, that will prevent the water from circulating through the pipes. Any cladding (otherwise it is called a clean floor covering) can be applied on top of the underfloor heating system, however, it should be borne in mind that warm air will flow from below and the material must be ready to withstand this. It is recommended to use ceramic or stone flooring or special laminated parquet [1, p. 7].

We tried to compare the underfloor heating system with radiator heating. And we have understood, that in the underfloor heating system, thermal energy is transmitted through radiation. In rooms with a radiator type of heating, the main type of heat transferring is convection. According to physics warm air streams rise up and with traditional heating, all the heat first rises to the ceiling, and only when it cools down, it sinks to the floor. Cold air accumulates near the floor, which is later drawn in by the radiator [1, p. 4]. Thus, the legs of a person are cold, and the head is warm, so his temperature distribution does not correspond to the physiological requirements of a person and creates a feeling of discomfort. In addition, if there are children in the house, it will not be safe to let them crawl or sit on the cold floor, because there is a risk of getting sick. So, you will need to buy carpets or restrict children. When heated with a warm floor, everything happens exactly the opposite: warm air is concentrated at the bottom, and cold air at the top. Due to this, our head remains in relative cold when our feet remain warm. So, a person feels much better. In addition, the room heats up evenly and there are no hot spots or cold corners. This effect is also provided by the frequency of installation of pipes in a warm field. At a cold wall (the one that faces the street), pipes should be laid more often (the recommended step is 10 cm) and going to the warm wall (the one that goes into the room with the other side), increase the step (in the middle, the recommended step is 15 cm, and against a warm wall – 20 cm). With this installation of pipes, there is no temperature difference that can create a draft that does not contribute to human comfort. (According to GOST 30494–2011, the temperature difference in the room should not be more than 7 degrees Celsius [2]). A draft can also create a poorly fitted window. You should choose two-chamber windows so that the glass that opens into the room is at room temperature.

In fact, underfloor heating does not create air circulation (convection), because it does not create drafts and distributes heat using radiation. So, along with the air, dust does not circulate through the room. Due to the fact that the floor always remains dry, mold does not form on it; the breeding ground for bacteria and dust mites is destroyed; natural air humidity is not lost, the air remains fresh [1, p. 5]. These factors are very important, because they can negatively affect human health.

Batteries of traditional heating can be difficult to wash, since they have complex curved shapes; sometimes it is impossible to wash the device completely. Warm floors are very hygienic. Cleaning and disinfecting this heating system are very simple: just wash the floor, which people often do, even with radiator heating. That is why underfloor heating is suitable for rooms in which it is especially important to comply with hygiene standards and frequent disinfection (medicine, food industry, especially clean industries, etc.).

Moreover, the design of the underfloor heating system is safe. The coolant temperature in this system is low. Underfloor heating allows you to get a heat flow of 100W per square meter of area at a coolant temperature of only 40-50 degrees Celsius, while radiator heating requires a coolant with a temperature of 70–90 degrees Celsius [1, p. 4]. The floor temperature is comfortable, there is no risk of scalding. Whereas if you unsuccessfully touch the radiator or convector, you can get burned, scratched or bruised. Compliance with safety is especially important when there are children in the room, since they do not always know what is dangerous for them and what is not.

We should say that many warm floors have a self-regulating effect. The system itself determines the required amount of supplied energy by the difference between the temperature of the floor surface and the air. So, for example, if it's hot outside, the windows are open and the air temperature is close to the floor temperature, the system reduces the amount of heat supplied, preventing the room from overheating. And also, if, for example, after airing in cold weather, the room temperature drops, then the heat transfer of the warm floor will automatically increase.

The underfloor heating system is comfortable and aesthetically pleasing. Despite the fact that a radiator can be chosen in any color and style, its existence on a whole sometimes does not fit the style. For example, if customers wanted to make an interior in the style of empiricism or baroque, modern radiators would be out of place. A skilled designer will be able to hide it or otherwise solve this problem, but with warm floors this problem would not arise at all. In addition, no battery means there is free space. With underfloor heating, there is more space for an interior solution, and it is also easier to make redevelopments. With traditional heating, changing the arrangement of furniture, you will have to take into account the location of the radiator batteries, which often interfere with the desired layout.

Warm floors are modern. Underfloor heating is the only type of heating that is ideally combined with modern energy-saving technology such as condensing boilers, heat pumps and solar panels [1, p. 5].

Warm floors are economical in terms of energy consumption, also due to their compatibility with modern energy-saving equipment. In addition, warm floors create a comfortable temperature environment for people, in which the legs are warm (22 degrees Celsius), and the head is in colder air (18 degrees Celsius), due to which a person feels good at a temperature of 2 degrees Celsius less than with radiator heating. This provides heat savings of 10–15% compared to radiator heating.

The underfloor heating system has a long service life. Underfloor heating has only one element that has a lifespan – a PE-X pipe. If installed correctly, it is designed to operate for at least 50 years [1, p. 5].

We should admit that the cost of arranging a warm floor system is higher than the cost of installing a radiator. The price difference exists due to the complexity of the underfloor heating installation. Most often, the pipes need to be poured with a concrete screed and connected to the boiler in a separate circuit. In addition, when installing a warm floor, it is imperative to carry out thermal insulation in order to avoid large heat losses. For this, a layer of insulation or profiled heat-insulating plates are laid. Otherwise, the heat will go down and warm the ground, basement or neighbors below. When planning a room, you should take into account the height that the warm floor will take. The total thickness of the “cake” ranges from 100 to 150 mm. Nevertheless, despite the high cost of installation, the warm floor pays for itself quite quickly, due to energy savings during use.

Radiators can be easily installed, dismantled and reassembled in the same place. It is difficult to repair underfloor heating. Pipes filled with concrete screed cannot be repaired [3]. It is possible to repair the underfloor heating system only at the stage of building a house or carrying out major repairs. The difference between radiators and underfloor heating system is shown in the Figure 1 below.

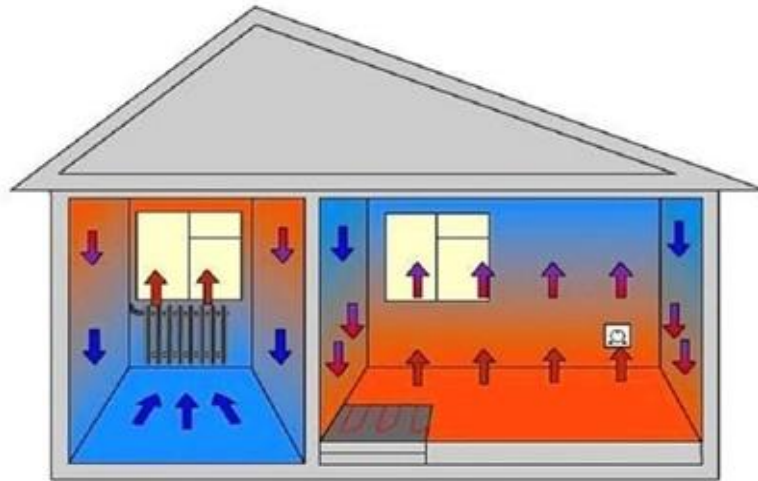


**Figure 1.** Radiators and underfloor heating system

Warm floors are inertial. Inertia is an indicator of the rate of heating and cooling of the room after turning on the heating. Underfloor heating slowly heats up after turning on the heating (about 3–5 hours, depending on the area of the room) and also gradually and slowly cool down. Radiators are non-inertial. They quickly heat up the building and cool down quickly (within an hour). Inertia cannot be precisely called an advantage or a disadvantage [2]. In some cases, for example, when it gets colder, inertia is bad, in others, for example, when you need to leave for a few days, you can turn off the warm floor to save energy, and the floors will be warm enough for a few more days, which is good.

Certainly, it is necessary to stress that the use of underfloor heating has certain limitations.

In well-insulated homes with satisfactory glazing, underfloor heating is often able to absorb heat loss. However, on stairs, in vestibules and other places where it is impossible to install it, the use of radiators or convectors is sometimes inevitable [1, p. 5].

In addition, water-heated floors are more often used in private homes. In urban apartments with centralized heating, the arrangement of such floors is almost impossible due to many technical difficulties. However, there are thin warm floors that have less power, but are thinner and lighter than conventional ones (only 3 cm high).

Due to the indicated limitations and disadvantages of underfloor heating, it is sometimes more expedient to combine two types of heating: the underfloor heating system and radiator heating. This combination will be a good alternative and will save the owners of the premises from the disadvantages of both systems. This method is best used when the area of the house is large and the overall heat loss of the building is large.

To install the underfloor heating system, it is important to comply with certain conditions:

1. The house must be insulated to a heat loss of no more than  $100 \text{ W} / \text{m}^2$  (for residential premises).

2. If a concrete underfloor heating system is planned, then the strength of the base must be higher than  $500 \text{ kg} / \text{m}^2$ .

3. The layout of the premises should allow the floor to be raised to a height of 15 cm. The thickness may vary depending on the requirements for the thickness of the thermal insulation, the diameter of the pipe, the thickness of the screed, which depend on the thermal insulation properties of the floor, the power of the underfloor heating, the cladding material, etc.

There are several types of warm floors: “concrete”, “light” and “thin”. “Concrete” warm floor is laid only on strong load-bearing reinforced concrete structures. Its main advantage is a sand-cement screed, which provides maximum comfort and heat transfer.

“Light” floors have a minimal load on the floors and therefore they have found their main application in wooden housing construction. Depending on the materials used, they can be divided into “wood” and “polystyrene”.

When laying a “thin” warm floor, pipes of a minimum diameter are used, so it takes only 24 mm in height [1, p. 5].

Before starting the installation of underfloor heating, you must:

1. Install exterior doors and windows.
2. Make a leveling screed on the ceilings (for concrete underfloor heating).
3. Finish internal plastering work.
4. To mark the level of the “clean” floor in all rooms.
5. Remove the connection points for sanitary water, sewerage and electricity.
6. Prepare niches for underfloor heating distribution cabinets.

Thus, the underfloor heating system is an important tool for creating a comfortable environment for people, a necessary tool for good design. The designer or the customer should be aware of its strengths and weaknesses and use it when needed. Due to the complexity of renovation, it is necessary to choose only high-quality products and hire professionals. However, this may not be enough: you need to control the performance of work, relying on the conditions and advice given in the article. If you install the underfloor heating system correctly, you can get heating that is able to provide such a high level of comfort and efficiency.

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**ОЦЕНКА ОРИЕНТАЦИИ АВТОНОМНОГО НЕОБИТАЕМОГО ПОДВОДНОГО  
АППАРАТА (АНПА) НА ОСНОВЕ СЕТИ ДАТЧИКОВ ДАВЛЕНИЯ  
ATTITUDE ESTIMATION OF AUTONOMOUS UNDERWATER VEHICLES BASED ON  
A NETWORK OF PRESSURE SENSORS**

**Аннотация.** Подводная навигация является сложной задачей для автономных необитаемых подводных аппаратов (АНПА), которая требует оценки положения и ориентации аппарата. Оценка ориентации на основе акселерометров проблематична, поскольку ее точность может ухудшиться на два порядка при ускорении АНПА. Датчики давления, на которые не влияет ускорение, предлагают эффективную альтернативу для определения ориентации. В данной статье предлагается метод оценки тангажа и крена с использованием сети датчиков давления и тщательный анализ точности метода, включая аналитическую оценку ошибки и нижнюю границу Крамера-Рао.

**Abstract.** Underwater navigation is a challenging task for Autonomous Underwater Vehicles (AUVs), which requires to estimate the position and orientation of the vehicle. Accelerometer-based attitude estimation is problematic as its accuracy can degrade by up to two orders of magnitude when the AUV is accelerating. Pressure sensors, which are unaffected by acceleration, offer an efficient alternative for determining orientation. This paper offers a method for pitch and roll estimation using a network of pressure sensors and a thorough analysis of the method's accuracy including analytical evaluation and the Cramér-Rao lower bound.

**Ключевые слова:** автономный необитаемый подводный аппарат (АНПА), датчики давления, морская навигация, система ориентации и определения курса, анализ ошибок.

**Key words:** autonomous underwater vehicle (AUV), pressure sensors, marine navigation, Attitude and Heading Reference System (AHRS), error analysis.

Accurate navigation is a crucial capability for an autonomous vehicle. Unlike ground and air vehicles, Autonomous Underwater Vehicles (AUVs) cannot rely on popular methods such as global navigation satellite system or visual odometry. Therefore, their navigation systems are mainly based on an inertial measurement unit and a Doppler velocity log for inertial navigation. The information provided by these sensors is fused by an Inertial Navigation System (INS) to estimate position and orientation. An Attitude and Heading Reference System (AHRS) can complement or replace the INS for orientation estimation.

Attitude estimation can be accomplished by a variety of methods, such as using inertial navigation, a gyrocompass, a magnetic compass, and/or DGPS (differential GPS). Underwater, however, fewer sensors are useable due to the attenuation of electromagnetic waves. Relevant sensors for the underwater environment are either very expensive or inaccurate. For example, a “low-cost” Microelectromechanical System-based AHRS has a typical estimation accuracy of about 10-mrad for pitch and roll and 20-mrad for heading under static conditions. However, when the vehicle maneuvers, the accuracy can degrade by up to two orders of magnitude due to the difficulty in extracting the earth's gravity vector as a result of the vehicle's acceleration. A distributed network of pressure sensors offers a way to solve this issue and improve the AHRS's attitude estimation.

Pressure sensors measure the ambient pressure in the AUV's surroundings. The main benefit of the pressure sensor is that it does not propagate error because no integration is needed. This accounts for their high reliability. We propose using this advantage to bound AHRS drift. A set of pressure sensors with a known layout can be used to estimate the vehicle's attitude: given an arrangement of pressure sensors and a depth measurement from each, pitch and roll can be determined.

The contributions of this work are as follows:

- 1) It demonstrates a method for pitch-and-roll estimation that can provide a solution under both static and dynamic conditions.
- 2) The error analysis provided for this method provides insight regarding the effects of the vehicle's attitude and sensor layout on the estimation error. The error is calculated and simulated under various conditions and the Cramer-Rao Bound (CRB) is calculated.

Given a layout of pressure sensors, a vector of pressure measurements  $[p_0, \dots, p_N]^T$  and the position of the sensors in the body frame, the rotation matrix to navigation frame,  $R_b^n$ , can be estimated. The coordinates of the  $i$ -th sensor in the navigation frame are:

$$[x_i^n, y_i^n, z_i^n]^T = R_b^n [x_i^b, y_i^b, z_i^b]^T + [x_{CM}^b, y_{CM}^b, z_{CM}^b]^T, \quad (1)$$

where  $[x_{CM}^b, y_{CM}^b, z_{CM}^b]^T$  are the coordinates of the center of mass. Arbitrarily choosing  $p_0$  to be the reference sensor and substituting this into (1), we obtain:

$$[x_i^n, y_i^n, z_i^n]^T - [x_0^n, y_0^n, z_0^n]^T = R_b^n ([x_i^b, y_i^b, z_i^b]^T - [x_0^b, y_0^b, z_0^b]^T), \quad (2)$$

where  $R_b^n$  is the rotation matrix defined by the Euler angles  $(\varphi, \theta, \psi)$ :

$$R_b^n \triangleq \begin{bmatrix} c\theta c\psi & s\varphi s\theta\psi - c\varphi s\psi & c\varphi s\theta c\psi + s\varphi s\psi \\ c\theta s\psi & s\varphi s\theta\psi + c\varphi c\psi & c\varphi s\theta s\psi - s\varphi c\psi \\ -s\theta & s\varphi c\theta & c\varphi c\theta \end{bmatrix}, \quad (3)$$

where  $c\alpha \triangleq \cos \alpha$  and  $s\alpha \triangleq \sin \alpha$ .

Choosing the origin of the body frame such that  $[x_0^b, y_0^b, z_0^b] = [0, 0, 0]$ , the third element of (4), becomes:

$$z_i^n - z_0^n = [-\sin \theta, \sin \varphi \cos \theta, \cos \varphi \cos \theta] [x_i^b, y_i^b, z_i^b]. \quad (4)$$

Utilizing the relation of pressure and depth from (4) can be formulated in terms of pressure measurements:

$$\frac{p_i}{\rho g} = [x_i^b, y_i^b, z_i^b] [-\sin \theta, \sin \varphi \cos \theta, \cos \varphi \cos \theta]^T + \frac{p_0}{\rho g} + \frac{\omega_i}{\rho g}, \quad (5)$$

where  $p_i$  is the pressure measurement of the  $i$ -th sensor with measurement noise  $\omega_i \sim N(0, \sigma_i^2)$  that is assumed to be Gaussian.

Defining the sensors layout matrix  $X$  to be:

$$X \triangleq [x^b \ y^b \ z^b] \in R^{N \times 3}, \quad (6)$$

we can write the vector form of (5) for  $N+1$  sensors as:

$$\frac{1}{\rho g} \begin{bmatrix} p_1 \\ \vdots \\ p_N \end{bmatrix} = X \begin{bmatrix} -\sin \theta \\ \sin \varphi \cos \theta \\ \cos \varphi \cos \theta \end{bmatrix} + \frac{1}{\rho g} \begin{bmatrix} p_0 \\ \vdots \\ p_0 \end{bmatrix} + \frac{1}{\rho g} \begin{bmatrix} \omega_1 \\ \vdots \\ \omega_N \end{bmatrix}. \quad (7)$$

For future use, we will use the following notation of samples taken at time  $t_k$ :  
 $p_k \triangleq \frac{1}{\rho g} [p_1 - p_0, \dots, p_N - p_0]_{t_k}^T$  и  $w \triangleq \frac{1}{\rho g} [\omega_1, \dots, \omega_N]^T$ . Thus, (7) at time  $t_k$  becomes:

$$p_k = X\Theta_k + w, \quad (8)$$

where  $\Theta_k$  is the transpose of the last row of the rotation matrix  $R_b^n$ :

$$\Theta_k \triangleq [-\sin \theta_{t_k}, \sin \varphi_{t_k} \cos \theta_{t_k}, \cos \varphi_{t_k} \cos \theta_{t_k}]^T, \quad (9)$$

Suggested method of attitude estimation autonomous underwater vehicle  
A Least Squares estimation of  $\Theta_k$  can be achieved by using:

$$\hat{\Theta}_k = (X^T X)^{-1} X^T p_k, \quad (10)$$

where the estimated vector is denoted as  $\hat{\Theta}_k \triangleq [\alpha_k, \beta_k, \gamma_k]^T$ , which relates to (9) by:

$$\begin{bmatrix} \alpha_k \\ \beta_k \\ \gamma_k \end{bmatrix} = \begin{bmatrix} -\sin \hat{\theta}_{t_k} \\ \sin \hat{\varphi}_{t_k} \cos \hat{\theta}_{t_k} \\ \cos \hat{\varphi}_{t_k} \cos \hat{\theta}_{t_k} \end{bmatrix}. \quad (11)$$

From (11), the AUV's roll and pitch angles can be estimated as:

$$\hat{\theta}_{t_k} = -\arcsin \alpha_k \quad (12)$$

$$\hat{\varphi}_{t_k} = \arcsin \left( \frac{\beta_k}{\cos \hat{\theta}_{t_k}} \right) \quad (13)$$

or alternatively:

$$\hat{\varphi}_{t_k} = \arccos \left( \frac{\gamma_k}{\cos \hat{\theta}_{t_k}} \right) \quad (14)$$

Cramér-Rao Boundary analysis

The Cramér-Rao lower bound is used to analyze the theoretical performance of this method. First, let us define the Fisher Information Matrix (FIM). Given an observation vector  $y(\Lambda)$  with parameters  $\Lambda$  and independent and identically distributed noise vector,  $\omega$ , with  $Cov(\omega) = \sigma^2 I$ :

$$y = \mu(\Lambda) + \omega.$$

The FIM is given by:

$$[I(\Lambda)]_{ij} = \frac{N}{\sigma^2} \sum_{m=1}^M \left[ \frac{\partial \mu_m(\Lambda)}{\partial \Lambda(i)} \right]^T \left[ \frac{\partial \mu_m(\Lambda)}{\partial \Lambda(j)} \right], \quad (15)$$

where M is the number of elements in the observation vector and N is the number of observations.

Given FIM  $I(\Lambda)$  of a parameters vector  $\Lambda$ , the CRB of the unbiased estimator  $\hat{\Lambda}$  states that:

$$\text{Var}(\hat{\Lambda}(i)) \geq [I^{-1}(\Lambda)]_{ii}. \quad (16)$$

In our case, with  $\Lambda \triangleq [\varphi, \theta]$  and (8):

$$\mu(\Lambda) = X \begin{bmatrix} -\sin \theta \\ \sin \varphi \cos \theta \\ \cos \varphi \cos \theta \end{bmatrix}. \quad (17)$$

Therefore:

$$\frac{\partial \mu(\Lambda)}{\partial \Lambda} \triangleq A = \begin{bmatrix} c\varphi c\theta X_{12} - s\varphi c\theta X_{13} & -c\theta X_{11} - s\varphi s\theta X_{12} - c\varphi s\theta X_{13} \\ c\varphi c\theta X_{22} - s\varphi c\theta X_{23} & -c\theta X_{21} - s\varphi s\theta X_{22} - c\varphi s\theta X_{23} \\ c\varphi c\theta X_{32} - s\varphi c\theta X_{33} & -c\theta X_{31} - s\varphi s\theta X_{32} - c\varphi s\theta X_{33} \end{bmatrix}. \quad (18)$$

Notice that:

$$A = X \begin{bmatrix} 0 & -\cos\theta \\ \cos\varphi \cos\theta & -\sin\varphi \sin\theta \\ -\sin\varphi \cos\theta & -\cos\varphi \sin\theta \end{bmatrix} \triangleq XB, \quad (19)$$

which means that the FIM for  $\Lambda$  is:

$$I(\Lambda) = \frac{1}{\sigma^2} \sum_{m=1}^M B^T X_m^T X_m B. \quad (20)$$

Analytical evaluation of the error

Given an estimated  $\hat{\theta}_{t_k}$  or  $\hat{\varphi}_{t_k}$ , we would like to know the estimation errors  $\delta\hat{\theta}_{t_k}, \delta\hat{\varphi}_{t_k}$  respectively. From (12):

$$\delta\hat{\theta}_{t_k} = \left| \frac{\delta \arcsin \alpha_k}{\delta \alpha_k} \delta \alpha_k \right| = \frac{1}{\sqrt{1-\alpha_k^2}} \delta \alpha_k. \quad (21)$$

Similarly:

$$\delta\hat{\varphi}_{t_k} = \frac{1}{\sqrt{1-\left(\frac{\beta_k}{\cos\hat{\theta}_{t_k}}\right)^2}} \frac{1}{|\cos\hat{\theta}_{t_k}|} \sqrt{\delta\beta_k^2 + \beta_k^2 \tan^2\hat{\theta}_{t_k} \delta\hat{\theta}_{t_k}^2}, \quad (22)$$

$$\delta\hat{\varphi}_{t_k} = \frac{1}{\sqrt{1-\left(\frac{\beta_k}{\cos\hat{\theta}_{t_k}}\right)^2}} \frac{1}{|\cos\hat{\theta}_{t_k}|} \left\| \left[ \beta_k \frac{\tan\hat{\theta}_{t_k}}{\sqrt{1-\alpha_k^2}} \delta\alpha, \quad \delta\beta, \quad 0 \right] \right\|_2. \quad (23)$$

Or by using  $\gamma$ :

$$\delta\hat{\varphi}_{t_k} = \frac{1}{\sqrt{1-\left(\frac{\gamma_k}{\cos\hat{\theta}_{t_k}}\right)^2}} \frac{1}{|\cos\hat{\theta}_{t_k}|} \left\| \left[ \gamma_k \frac{\tan\hat{\theta}_{t_k}}{\sqrt{1-\alpha_k^2}} \delta\alpha, \quad 0, \quad \delta\gamma \right] \right\|_2. \quad (24)$$

Using (11), we can rewrite (21) and (23)-(24) as:

$$\delta\hat{\theta}_{t_k} = \frac{1}{|\cos\hat{\theta}_{t_k}|} \delta\alpha_k, \quad (25)$$

$$\delta\hat{\varphi}_{t_k} = \frac{1}{|\cos\hat{\varphi}_{t_k} \cos\hat{\theta}_{t_k}|} \left\| [\sin\hat{\varphi}_{t_k} \tan\hat{\theta}_{t_k} \delta\alpha, \quad \delta\beta, \quad 0] \right\|_2, \quad (26)$$

$$\delta\hat{\varphi}_{t_k} = \frac{1}{|\sin\hat{\varphi}_{t_k} \cos\hat{\theta}_{t_k}|} \left\| [\cos\hat{\varphi}_{t_k} \tan\hat{\theta}_{t_k} \delta\alpha, \quad 0, \quad \delta\gamma] \right\|_2, \quad (27)$$

where,  $\delta\alpha_k, \delta\beta_k$  are the estimation errors of  $\alpha_k, \beta_k$ , respectively, derived from  $\delta\hat{\Theta}_k$ . For the linear least squares problem,  $Cov(\hat{\Theta}_k) = (X^T X)^{-1} \sigma^2$ .

From (25) and (26), the attitude estimation error can be assessed:  $\delta\hat{\theta}_{t_k}$  diverges for  $\theta \sim \pi/2$ , thus our estimation will perform better at smaller pitch angles.  $\delta\hat{\varphi}_{t_k}$  is affected both by  $\delta\hat{\theta}_{t_k}$ , and  $\beta_k/\gamma_k$ . The symmetry between (26) and (27) suggests that estimating  $\varphi_{t_k}$  by using  $\gamma_k$  will generate a smaller error for  $\varphi > \pi/2$ .

Using an optimized sensor layout will yield even better results, surpassing a typical AHRS for both dynamic and static conditions. Future research will evaluate the overall performance of these sensors when tightly coupled to the AHRS filter, in a real-time application.

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## **ВЛИЯНИЕ АВТОТРАНСПОРТА НА СОСТОЯНИЕ АТМОСФЕРНОГО ВОЗДУХА ГОРОДА THE INFLUENCE OF MOTOR VEHICLES ON ATMOSPHERIC AIR OF THE CITY**

**Аннотация.** В данной работе исследуется экологическая проблема загрязнения воздуха в г. Севастополь. С этой целью автор рассматривает вопросы, связанные с необходимостью сокращения выбросов загрязняющих веществ автомобилями, имеющих двигатель внутреннего сгорания. Установлено, что в пиковый туристический сезон 2020 года г. Севастополь посетило не менее 1 млн. туристов, 30% из них прибыли на личном, коммерческом или арендованном автотранспорте. Выявлено, что суммарные выбросы от данного источника в 2020 году увеличились, в сравнении с 2019 годом и составили 8,3145 тыс. тонн. В работе предлагается решение поставленных задач, путем включения основных магистралей города в систему мониторинга атмосферного воздуха. Автор приходит к выводу, что необходимо контролировать группу определенных веществ, таких как аммиак, бензол, сероводород, сероуглерод, фенол, формальдегид и другие ароматические углеводороды.

**Abstract.** This paper investigates the environmental problem of air pollution in the city of Sevastopol. To achieve this, the author considers the issues related to the need to reduce pollutant

emissions from vehicles with an internal combustion engine. It is established that in the peak tourist season of 2020, Sevastopol was visited by at least 1 million tourists, 30% of them arrived on a personal, commercial or carsharing motor transport. It was revealed that the total emissions from this source in 2020 increased in comparison with 2019 and amounted to 8,3145 thousand tons.

The main highways of the city should be included in the atmospheric air monitoring system. The author concludes that it is necessary to control a group of specific substances such as ammonia, benzene, hydrogen sulfide, carbon disulfide, phenol, formaldehyde, and other aromatic hydrocarbons.

**Ключевые слова:** загрязнение, автотранспорт, выброс, атмосфера, Севастополь.

**Key words:** pollution, motor transport, emission, atmosphere, Sevastopol.

Today, despite the fact that a large number of studies are being conducted in different countries and attempts are being made to reduce the harm of internal combustion engine exhaust (including new fuel standards effects), motor transport remains the most powerful factor in urban air pollution. This fully applies to the city of Sevastopol. The dynamics of recent years shows a steady increase in the number of motor vehicles registered in the city of Sevastopol. According to the Traffic Police department of the Ministry of Internal Affairs of Russia in Sevastopol 202,172 898 vehicles were registered as of January 1, 2012 [1; 3].

Sevastopol region has unique tourist and recreational resources. Summarizing various data, in 2020 it is possible to estimate the tourist flow to Sevastopol at the level of at least 1 million per year, while more than 30 % of tourists travel by private car or under the program of car rental [3].

The construction of a new highway contributes to the increase in the flow of tourists by private vehicles. “Tavrida” will increase the capacity; contribute to ensuring the tourist attractiveness and economic development of the city. The continuation of the Tavrida highway in Sevastopol will be Kamyshovoe Highway, which will provide access to the port infrastructure, increase trade turnover, and develop industry [4].

Officially published on the website of the Federal State Statistics Service, statistical data for the city of Sevastopol indicate a significant increase in road transport in recent years (Table 1) [2].

The main pollutants in the emissions of motor vehicles running on gasoline are: carbon monoxide, hydrocarbons, nitrogen oxides, benzopyrene, aldehydes, and soot. There are nitrogen oxides, sulfur oxides, and soot as typical emissions in vehicles running on diesel fuel. According to the Federal State Statistics Service (Table 2), the emissions of pollutants from motor transport in 2020 increased in comparison with 2019 and amounted to 8,3145 thousand tons [2].

The Department of Transport states that the hardest traffic is on the roads of Sevastopol are Kovpaka – Tolstogo Streets, tunnel on Generala Petrova Street and Pozharova Street, Admiral Oktyabrsky and pl. Vosstavshikh, Ostryakova st. and Oleg Koshevoy St., Letnyaya St. and Geroyev St. of Sevastopol, highways in the area of Pobeda Park [4].

**Table 1.** The number of urban road transport in Sevastopol 2017–2020 years

| Type of vehicle | Number of vehicle units (items) |        |        |        |
|-----------------|---------------------------------|--------|--------|--------|
|                 | 2017                            | 2018   | 2019   | 2020   |
| Buses           | 370                             | 1445   | 2176   | 2260   |
| Trucks          | 2687                            | 6400   | 10937  | 10427  |
| Passenger cars  | 18365                           | 96958  | 135035 | 140081 |
| Total           | 21422                           | 104803 | 148148 | 152768 |

**Table 2.** The volume of emissions of pollutants from vehicles for 2017–2020 years in Sevastopol

| Pollutant name | The volume of pollutants (thousand tons) |      |      |      |
|----------------|------------------------------------------|------|------|------|
|                | 2017                                     | 2018 | 2019 | 2020 |

|                            |      |      |        |        |
|----------------------------|------|------|--------|--------|
| Carbon oxide               | 17,9 | 27,4 | 6,0869 | 6,1346 |
| Nitrogen oxide             | 2,5  | 3,9  | 1,643  | 1,6163 |
| Soot                       | 0,03 | 0,05 | 0,0288 | 0,0279 |
| Volatile organic compounds | 2,5  | 3,8  | 0,2747 | 0,2717 |
| Sulphurous anhydride       | 0,11 | 0,18 | 0,0774 | 0,0766 |
| Methane                    | 0,1  | 0,15 | 0,0249 | 0,0255 |
| Ammonia                    | 0,08 | 0,11 | 0,16   | 0,1623 |
| Total                      | 23,2 | 35,6 | 8,2957 | 8,3145 |

Vehicle emissions in urban areas enter the surface layer of air, where their dispersion is difficult. Depending on the distribution of traffic flows in the city, under the influence of meteorological conditions, fields of concentrations of dispersed impurities are formed. Historically developed urban infrastructure determines the impurity sets.

The above confirms that it is necessary to develop a set of measures to reduce the impact of motor transport on the state of atmospheric air in the city. One of the priority areas in this plan is the use of alternative fuel. Of all the mass-used types of motor fuel and technologies, only natural gas provides the safest exhaust gas emissions of motor vehicles. Switching gasoline-powered vehicles can reduce emissions of harmful substances by an average of five times, and reduce noise exposure – by half.

Conclusion. Due to the deteriorating environmental situation, the use of alternative types of motor fuel, in particular compressed natural gas is becoming an increasingly urgent task. In addition, the price of gas fuel is significantly lower than that of oil fuel, accounting for 30–60 % of the cost of gasoline and 50–70% of the cost of diesel fuel.

The main highways of the city should be included in the atmospheric air monitoring system. The program of mandatory observations should include a group of basic substances – general suspended matter (dust), nitrogen dioxide, carbon monoxide, and sulfur dioxide. It is also necessary to control a group of specific substances (ammonia, benzo(a)pyrene, benzene, carbon disulfide, hydrogen sulfide, phenol, formaldehyde, hydrogen fluoride and other aromatic hydrocarbons) and a group of heavy metals (cadmium, nickel, mercury, lead).

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**АНАЛИЗ МЕТРОЛОГИЧЕСКОГО ОБЕСПЕЧЕНИЯ ТЕРРИТОРИАЛЬНОГО  
ЦЕНТРА МЕТРОЛОГИИ В ГОРОДЕ СЕВАСТОПОЛЕ**  
**ANALYSIS OF METROLOGICAL ACTIVITY OF THE METROLOGY TERRITORIAL  
CENTER IN SEVASTOPOL**

**Аннотация.** В статье рассматриваются поверочные лаборатории Территориального центра метрологии в городе Севастополе. Основными заказчиками метрологических услуг являются судоремонтные предприятия, судостроительные предприятия, учреждения военно-медицинской службы (поликлиники, больницы), корабли, суда обеспечения и воинские части. Учитывается оснащенность лабораторий и соответствие нормативным документам. Проведен причинно-следственный анализ и построена диаграмма, отображающая взаимосвязи между качеством результата поверки средств измерений и причинами, влияющими на данное качество. Определены основные факторы: персонал, методы, эталоны, условия проведения. Используя результаты причинно-следственного анализа, предлагается разработать номенклатуру показателей, характеризующих качество проведения поверки средств измерений, что позволит лабораториям проводить самооценку своей деятельности (аудит процесса). Рассмотрена возможность применения контрольных карт при оценивании стабильности для исследования измерительного процесса поверки.

**Abstract.** The article discusses the verification laboratories of the Metrology Territorial Center in the city of Sevastopol. The main customers of metrological services are ship repair enterprises, shipbuilding enterprises, military medical service institutions (polyclinics, hospitals), ships, support vessels and military units. The equipment of laboratories and compliance with regulatory documents are considered. A causal analysis was carried out and a diagram was constructed showing the relationship between the quality of the result of verification of measuring instruments and the reasons affecting this quality. The main factors include personnel, methods, standards, conditions of the event. Using the results of causal analysis, it is proposed to develop a nomenclature of indicators characterizing the quality of verification of measuring instruments, which will allow laboratories to conduct self-assessment of their activities (process audit). The possibility of using control cards in assessing stability for the study of the measuring process of verification is considered.

**Ключевые слова:** поверочная лаборатория, поверка, измерение, средство измерения, рабочее средство измерения, образцовое средство измерения.



**Key words:** verification laboratory, verification, measurement, measuring instrument, workplace, working measuring instrument, model measuring instrument.

The laboratories of the Territorial Center of Metrology in the city of Sevastopol carry out verification of workers and samples of measuring instruments, maintenance and repair of measuring instruments for ship repair and shipbuilding enterprises, military medical service institutions, ships, support vessels, military units and individual samples of military equipment. To carry out activities in the field of ensuring the uniformity of measurements, laboratories must have equipment, measuring instruments, software, standards, and auxiliary devices, which is necessary for the proper implementation of laboratory activities.

The purpose of the study is to review the activities of the verification laboratories of the territorial center of metrology in the city of Sevastopol, as well as conducting a causal analysis and determining factors affecting the quality of the verification result.

RMG 128–2013 states that ensuring compliance with mandatory requirements for working conditions in premises for laboratories performing measurements (stable temperature, low vibration, etc.) is laid at the design stage of the laboratory [4]. The verification unit of the Territorial Metrology Center is located in a special building away from high-voltage power lines, contact power grid (electric transport), sources of vibration, noise (with a level above 90 dB), radio interference (electric welding and high-frequency electrical equipment) and from objects that create strong magnetic or electric fields (converter substations, induction heating installations, etc.) [5].

The laboratories of the Territorial Center of Metrology in the city of Sevastopol are equipped with workplaces, instruments and the necessary conditions for carrying out work. The verification room and environmental conditions are suitable for laboratory activities and do not have a negative impact on the reliability of the results obtained. General requirements for the room are set out in the Safety Instructions for the verification of measuring instruments of a particular laboratory. The instructions are located directly in this room. According to it, all the verification equipment at the workplaces intended for the removal of calibration characteristics is installed in such a way that the safety of equipment maintenance and the convenience of monitoring the readings of verifiable and exemplary devices are ensured. There are requirements that must be met before, during and after work.

So, for example, in the laboratory of vacuum and pressure verification, before starting work in the laboratory, there should be tools and other things designed to work with vacuum and pressure measuring devices (wrenches, rags, screwdrivers), protective equipment (bathrobes, protective hand creams). The hydraulic press is installed on a solid foundation that is not subject to vibration, and the loads are stored in a place that excludes their spontaneous displacement. When installing and removing pressure gauges from the press, two serviceable keys should be used. At the end of work, the workplace is put in order, and the oiled rags are removed from the room in order to prevent its spontaneous combustion.

Also, the following instructions should be located in the vacuum and pressure testing laboratory:

- instruction “General electrical safety measures”;
- safety instructions for checking pressure and vacuum measuring instruments;
- safety instructions for checking oxygen pressure gauges;
- instructions for first aid in case of electric shock;
- instructions on fire safety measures.

Each device is assigned a place of operation (storage) and a person responsible for operation. Each workplace is certified and has a passport. The passport contains a description of the workplace.

The requirements for environmental conditions are specified:

- temperature 20–22 °C;
- relative humidity 30–80 %;
- atmospheric pressure 710–80 mmHg;

- voltage 220–4,4 V;
- the network frequency is 50–0,5 Hz.

The requirements established for premises and environmental conditions necessary for carrying out laboratory activities must be documented. Also, the laboratory should monitor environmental conditions, manage them and register them in accordance with technical requirements, methods and techniques in cases where they affect the reliability of the results. To comply with these requirements, a temperature and humidity regime (THR) log is kept, which is also constantly in the vacuum and pressure measurement laboratory. To do this, there is a set of THR post measuring instruments in the room, namely a thermometer, hygrograph, aspiration psychrometer. The set of documentation of the THR post contains: – hemmed hygrograph tapes used since the beginning of the year; – temperature log; – copies of certificates of verification of measuring instruments of the THR post.

Measuring instruments are placed at a height of 1500 mm from the floor, in places that exclude direct exposure to heating systems, outdoor air and vibrations. The frequency of accounting for environmental parameters in accordance with the requirements of regulatory and technical documentation for the certification of standards (verification of measuring instruments), but at least once every 3 hours, for example at 9.00, 12.00, 15.00.

An important role in the laboratory is played by the illumination of workplaces. The coefficient of natural illumination on the surface of the verifier's table is allowed in the range of 1.00 – 1.50. The conditions are provided in such a way that the daylight in the room is diffused and does not give glare, for which blinds are installed on the windows. For example, it is recommended to place windows in rooms where vacuum and pressure measuring instruments are verified on the north side of the building. Walls up to 3/4 of their height are painted with oil paint of light tones, the rest of the walls and ceilings are painted with white durable paint that allows wiping. In this laboratory, the color of the walls is light green. There are no special requirements for the floors of the room, so they are covered with linoleum.

At each workplace there is a local verification scheme that regulates the methods, means and errors of transmitting the unit of measurement.

In addition to the equipment and measuring instruments, the verification laboratory is equipped with the necessary furniture. The furniture is listed in the inventory of the material values of this room. The material values of the verification laboratory include, for example, tables (universal and side tables), chairs, racks, cabinets (metal and glass), a fire extinguisher, air conditioning, vertical blinds, a switchboard, a computer, a printer, etc.

The verification laboratories of the Territorial Center of Metrology in the city of Sevastopol fully comply with the requirements established by the Ministry of Defense of the Russian Federation for military units and units engaged in activities in the field of ensuring the uniformity of measurements.

For five years, the laboratory and the metrology center as a whole in the declared field of activity can carry out work to ensure the uniformity of measurements, and accordingly, during this time, the laboratory must ensure the accuracy and reliability of the work carried out. The quality of the measuring process depends on the correctness of the decisions taken on the verification of measuring instruments in any verification laboratory of the Territorial Center of Metrology in the city of Sevastopol.

In general, a measurement process is a process that converts the value of a measured parameter into a measurement result by using certain resources. The resources of the activity of the verification laboratory, in accordance with the measurement procedure, include measuring equipment, auxiliary equipment, operators (laboratory staff or verifiers), the environment discussed above in this work. A significant contribution to the correct implementation of verification procedures is made by the interaction of laboratory staff, the measuring instruments used, the measurement methods used and the environmental conditions resulting in the measurement, that is, verification.

In order to obtain accurate and reliable laboratory verification results, it is advisable to evaluate the stability of the measuring process (stability of the verification process of working and

exemplary measuring instruments), that is, the definition of a statistically controlled process. Carrying out measurements during verification works that are in a statistically controlled state has a predictable course of the process. The offset of the arithmetic mean of the measured value is either absent (Figure 1, a), or has a constant value over time, and the spread of the values of the measured value is within the predicted limits [1]. Unstable state of verification may be characterized by various factors affecting the quality of verification (Figure 1, b).

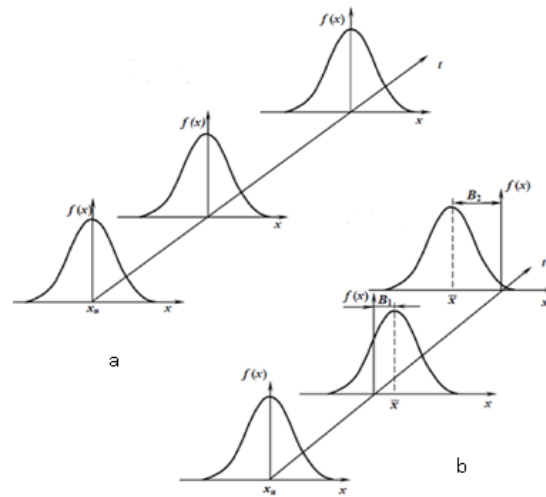


**Figure 1.** Schematic representation of the measuring processes state

To study the measuring process of stability verification, it is advisable to use control maps of averages and spans [2, 3]. To identify the causes of variability of measurement processes, it is proposed to identify factors affecting the quality of the verification result (Figure 2). A causal diagram is used to identify factors [6].

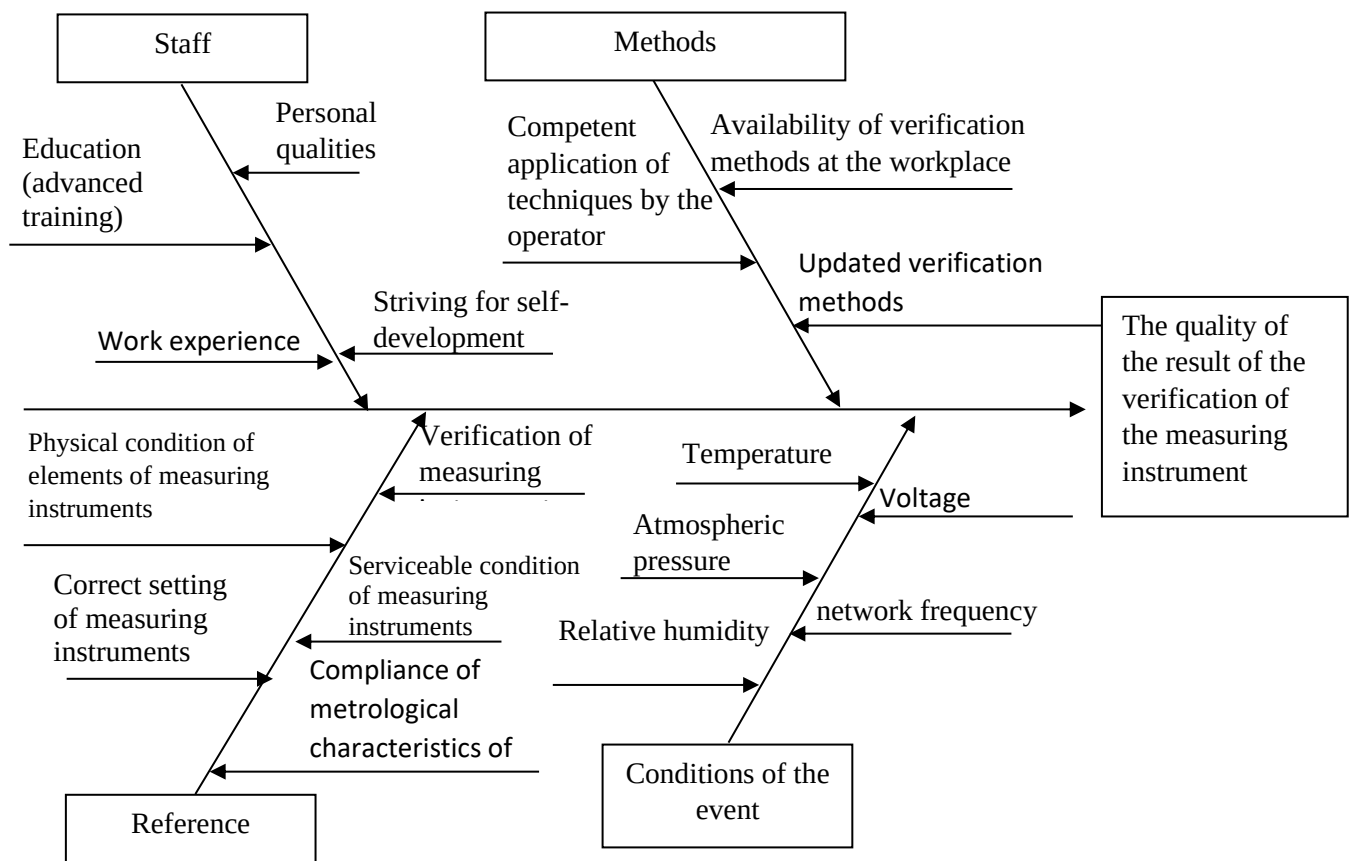


**Figure 2.** Factors affecting the quality of the verification result of the measuring instrument

Figure 2 shows a causal diagram showing the relationship between the quality of the result of verification of the measuring instrument and the reasons affecting this quality.

The cause-and-effect diagram is based on the use of the brainstorming method, which made it possible to identify the key factors of the process that affect the quality of the result of checking measuring instruments. This will allow the following studies to be carried out: 1) to develop a nomenclature of indicators characterizing the quality of verification of measuring instruments, which will allow laboratories to conduct a self-assessment of their activities (process audit); 2) to evaluate the stability for the study of the measuring process of verification when using control cards.

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**ПСИХОЛОГИЧЕСКОЕ СОПРОВОЖДЕНИЕ ЛИЦ  
С УМЕРЕННОЙ УМСТВЕННОЙ ОТСТАЛОСТЬЮ И ТЯЖЕЛЫМИ  
МНОЖЕСТВЕННЫМИ НАРУШЕНИЯМИ РАЗВИТИЯ  
В УЧЕБНО-ПРОИЗВОДСТВЕННЫХ МАСТЕРСКИХ  
PSYCHOLOGICAL SUPPORT OF PERSONS WITH MODERATE MENTAL  
RETARDATION AND SEVERE MULTIPLE DEVELOPMENTAL DISABILITIES IN  
TRAINING AND PRODUCTION WORKSHOPS**

**Аннотация.** В данной статье рассматриваются организационные и методические вопросы психологического сопровождения лиц с умеренной умственной отсталостью и тяжелыми и множественными нарушениями развития в условиях учебно-производственных мастерских на примере работы ИОООИД «Надежда». В статье представлены направления деятельности психолога в организации, основные методы и особенности оказания психологической помощи.

**Abstract.** This article examines the organizational and methodological issues of psychological support for persons with moderate mental retardation and severe and multiple developmental disabilities in the conditions of training and production workshops on the example of the work of "Nadezhda". The article presents the directions of the psychologist's activity in the organization, the main methods and features of the provision of psychological assistance.

**Ключевые слова:** умственная отсталость, нарушения развития, интеллектуальные нарушения, психологическое сопровождение, учебные мастерские.

**Key words:** mental retardation, developmental disabilities, intellectual disabilities, psychological support, training workshops.

The relevance of this research topic is due to the fact that at the moment in Russia there are no methodological development of programs for psychological support for people with moderate mental retardation and severe multiple developmental disorders when they are objectively necessary.

The object of the research is psychological support of persons with moderate mental retardation and severe multiple developmental disorders. The subject of the research is psychological support of persons with moderate mental retardation and severe multiple developmental disabilities in training and production workshops.

The aim of the study is to reveal the features of psychological support for persons with moderate mental retardation and severe multiple developmental disabilities in the conditions of training and production workshops.

Irkutsk regional public organization of disabled children “Nadezhda” provides assistance to people with mental and intellectual disabilities in social, labor and household rehabilitation, pre-professional training.

“Nadezhda” organizes the work of woodworking, sewing and handcraft, felting, printing, weaving and candlestick workshops. The main task of social therapists and masters is to reveal the abilities of a person, to develop his skills of independent work.

Despite such a wide range of social services provided, the children of the organization, as well as their families, need psychological support. At the moment in Russia there are no fully developed practical guidelines, methodological recommendations, etc. to provide psychological assistance or psychological support for persons with intellectual disabilities. In view of the fact that every person with moderate mental retardation and severe multiple developmental disabilities requires an individual approach to the provision of psychological assistance, it is impossible to prepare a single program for their psychological support. Nevertheless, it is advisable to systematize a variety of methods of providing psychological assistance to people with moderate mental retardation and severe multiple developmental disabilities and bring them into a single system. An individual approach lies precisely in which of the methods is most suitable for psychological support of a particular person with disabilities.

Psychological support of persons with moderate mental retardation and severe multiple developmental disabilities in educational and production workshops has two main areas: work with parents and work with pupils.

1) Interaction with parents includes informational – cognitive and leisure activities.

Information and cognitive activity are aimed at familiarizing with the psychological characteristics of children, identifying parental requests. It includes general meetings, one-on-one talks and consultations.

Leisure activities are aimed at establishing contact between employees of the institution, parents and children. It consists in the participation of parents in the preparation and holding of holidays, open days, the creation of an exhibition of products, the publication of information and educational newspapers, etc.

2) Work with pupils is aimed at adaptation and socialization, it includes three main blocks:

- psychological counseling;
- psychotherapy;
- accompaniment throughout the day.

Accompanying during the day takes place both directly in the institution and outside it. When building a daily routine, week, month, year, it is especially important to take into account a single rhythm. As T.A. Fedorov “it is the rhythm formed due to the repetition of successive events that allows the birth of predictability, which is of great therapeutic importance” [4, p. 48].

Directly in the institution, work is supported in workshops, in a gym, in physical therapy classes. Also, psychological and pedagogical support includes the formation of skills for an independent life (mainly household).

Accompanying pupils outside the institution includes joint walks in the park and visiting cultural and creative events.

The main emphasis in the work of a psychologist is made on consulting and psychotherapeutic activities. It should be borne in mind that counseling is not possible entirely by persons with disabilities. It should also be emphasized that in working with people with organic disorders in the activity of the brain, clinical methods should be used.

The structure of the consultation process is built on the model proposed by R. Kochunas [2]. The consultant uses teaching, modeling, developmental, and transformative methods. The psychologist uses such techniques of psychological counseling as: interpretation,

feedback, information, logical sequence, influencing resume, encouragement, repetition of open and closed questions, understanding emotions, etc.

When building psychological counseling programs, work planning is built taking into account the need for a comprehensive impact on all components of psychological attitudes, i.e. into cognitive, affective and behavioral components [1, p. 174].

Consulting activities include such main directions as developmental, correctional and vocational guidance.

Psychotherapeutic activity is based on the use of various areas of art therapy: isotherapy, sand therapy, clay therapy, music therapy, etc.

In art therapy, fractal drawing and the technique of "drawing shapes" are actively used. It is based on the therapeutic harmonization of our inner states through rhythm. As R. Kyutzli himself notes, "drawing of forms speaks through the rhythm that brings harmony, through the formative and dissolving, exciting and calming, cosmic and earthly in the human being. Through this, the concentration, the strength of the I, is enhanced, confronting the constant threat of sclerotization of thinking, constraint or sterility of the soul, apathy of the volitional sphere. Such a practice can become a source of revitalizing, healing, activating strength in the soul" [3, p. 8].

When working with people with moderate mental retardation and severe and multiple developmental disorders, the selection of therapy methods is especially important. Special attention should be paid to fairy tale therapy. As E.V. correctly believes. Cech, "any storytelling is already therapeutic in itself. It is better to tell a fairy tale, and not to read it. while the therapist can observe what is happening in the process of consulting with the client" [5, p. 35].

Especially for the work with the pupils of the IOOID "Nadezhda", a program of fairy tale therapy with the use of fables was developed. Fairytale therapy using fables is more accessible to perception and understanding than ordinary fairy tales and has wide possibilities and prospects of application.

Thus, psychological support of persons with moderate mental retardation and severe multiple developmental disabilities in educational and production workshops has two main directions: work with parents and work with pupils. Interaction with parents includes informational-cognitive and leisure activities. Work with pupils is aimed at adaptation and socialization and includes psychological counseling, psychotherapy, as well as support during the day.

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## **ИЗУЧЕНИЕ АНГЛИЙСКОГО ЯЗЫКА С ПОМОЩЬЮ МУЗЫКИ LEARNING ENGLISH WITH THE HELP OF MUSIC**

**Аннотация.** В статье описывается как с помощью музыки можно изучать английский язык. Рассматриваются различные музыкальные направления. Обсуждается важность изучения английского языка в раннем возрасте на основе детских песен. Пение позволяет изучить новые слова, научиться их правильному произношению, а также повысить коммуникационную активность с другими людьми. Использование современных технологических средств позволяет беспрепятственно изучать английский язык в любой точке мира. Такой подход к изучению английского языка должен обязательно внедряться в языковую практику школ и высших учебных заведений.

**Abstract.** This article describes how you can learn English with music. Various musical directions are considered. The importance of learning English at an early age through children's songs is discussed. Singing allows you to learn new words, learn their correct pronunciation, and increase communication activity with other people. The use of modern technological tools allows you to freely learn English anywhere in the world. This approach to learning English must be introduced into the language practice of schools and higher educational institutions.

**Ключевые слова:** английский язык, музыка, музыкальные направления, коммуникативные навыки.

**Key words:** English, music, musical trends, communication skills.

It is known that music is an art form. It affects a person through sound images that reflect his/her various experience and the surrounding life. Music often accompanies each of us during our rest, work, study or just doing business. We listen to different music. All of it is very diverse.

There are many styles of music. These include: academic (in particular, classical), folk (or ethnic) and pop music and others. Music can be lyrical and dramatic, calm and danceable, dynamic and relaxing, etc. Music is diverse and can be characterized by many other adjectives. Music is always more than the usual set of rhythms and sounds; it can help you get through difficult moments in life or complement a joyful event. And most important, music can help you learn English [1–5].

Let's think about how useful music is for developing language skills? We believe that learning English from the songs of your favorite singers is funny and rewarding. With musical compositions, you can hone your knowledge and enjoy your favorite hits at the same time.

In the early stages of a person's life, English music also plays an important role. Children will be able to learn words faster if they hear them in children's English songs. These songs are based on the repetition of the same words, allowing kids to fill their vocabulary. For example, Finger Family English Song helps you learn the names of your fingers and family members. The English alphabet is also easier to learn with songs [5].



As you listen to the song, you will learn new words that you haven't heard before, or you will notice that some words are used in a different context with a different meaning. Listening to and learning a new song a week can help you learn 52 songs a year that are full of new vocabulary and phrases that are hard to forget. For example, listening to a song like Tyler's "Earthquake". The Creator is a great way to improve your pronunciation! The accent depends not only on the country, but also on the area where the singer comes from. Singing will help you learn the correct pronunciation of words, it will also help you easily memorize new vocabulary that you previously did not know, and will also remind you of what you previously learned. This exercise also develops your listening skills. Music will help your brain to be more receptive to English speech [2].

Don't forget to sing too! Yes, that's right, when listening to some songs, try opening your mouth and singing along. Since you are imitating sounds, your language will become more accustomed to English sounds, which will improve your English pronunciation [1].

Music promotes the development of communication skills between people. Understanding English is much easier when there is no tension in communicating with other people. When you are passionate about one common idea – strive to understand each other, the joint performance of musical works will not only help you to relax, but will also help to establish auditory and verbal contact with the interlocutor.

All this music is in the public domain, and you can listen to it and learn English at any time, the main thing is to have a desire, and then you will succeed! In addition, you can save music on your gadget, and then listen and study English on the road, in the car, on the train, or on the plane. Thus, learning English through music should become an integral part of the educational process not only in schools, but also in higher educational institutions.

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**ИЗУЧЕНИЕ ИСТОРИИ В ШКОЛЕ КАК ПЕРСПЕКТИВНОЕ  
НАПРАВЛЕНИЕ ВОСПИТАНИЯ ШКОЛЬНИКОВ –  
БУДУЩИХ ЧЛЕНОВ РОССИЙСКОГО ОБЩЕСТВА  
THE STUDY OF HISTORY AT SCHOOL AS A PROMISING DIRECTION OF  
EDUCATION OF SCHOOLCHILDREN – FUTURE MEMBERS OF RUSSIAN SOCIETY**

**Аннотация.** В статье основное внимание уделяется школьному предмету «История» как средству сохранения, закрепления и передачи нравственных, культурных и духовных ценностей подрастающему поколению. Акцентируется внимание на том, что задача правильного воспитания лежит не только на семье, но и на школе как важном социальном институте и ее сотрудниках (учителях). Дается обзор современных подходов к образовательным функциям дисциплины. В работе также представлены результаты опроса, выявляющего непосредственное влияние количества гуманитарных дисциплин (в том числе и истории) в учебной программе на степень гражданской сознательности студентов и развитие у них нравственных качеств.

**Abstract.** The paper focuses on the school subject “History” as a means to preserve, consolidate and transmit moral, cultural and spiritual values to younger generation. Attention is focused on the fact that the task of proper education lies not only on the family, but also on the school as an important social institution and its employees (teachers). An overview of modern approaches to the educational functions of the discipline is given. The work also presents the results of a survey revealing the direct impact of the number of humanities disciplines (including history) in the curriculum on the degree of civic consciousness of students and the development of their moral qualities.

**Ключевые слова:** молодежь, образование, история, общество, гражданское воспитание, поликультурное воспитание, нравственное воспитание, патриотическое воспитание.

**Key words:** youth, education, history, society, civic education, multicultural education, moral education, patriotic education.

The value of history as a school subject is being widely discussed and highlighted by leading Russian educators. The aim of the article is to review modern approaches to the role and functions of history as a school subject. The main idea highlighted in the reviewed works is supposed to be proved by the results of survey conducted by the author. The survey aimed to disclose the relation between the amount of humanities in a school curriculum and degree of moral and cultural development of students.

The study of history is an effective tool to meet contemporary requirements for civic, patriotic and moral education of new generation. This idea is emphasized in modern publications. V. Lutovinov underlines that rich and complex nature of the subject ensures reaching the most important goals of education: to form a moral personality, to encourage the desire for the spiritual values of Russian society, to determine the students' ideological beliefs, based on the awareness of historically formed traditions, attitudes and ideological doctrines [7, p. 222]. The author considers the

main task of history to encourage students' curiosity about national identity and patriotic self-consciousness. It is at the history lessons that the foundations of moral education are determined and developed, manifested in a tolerant attitude towards people around them, by realizing the tragic results of attempts to impose inequality, manifestations of aggression and suppression of individual freedom. Knowledge of past events allows new generation to learn about the spiritual values of our ancestors, which positively affects the development of historical memory, a sense of connection with the fate of the Motherland, responsibility and readiness to serve the Fatherland. This is the most important condition for moral, spiritual and patriotic education [7, p. 220–222]. T. Gogunskaya regards historical heritage as contributing to positive personality traits that are necessary for any citizen of any age. The most important task of teachers in relation to the younger generation is to draw attention to the history of their country, to teach current students to acquire knowledge throughout their lives, which undoubtedly contributes to strengthening spiritual and moral norms and ideals in society [2, p.37]. In this regard, the role of a history teacher turns into a guide, not forcing you to fully adopt and share your values [3, p. 61].

The goals of history study comply with the State cultural policy of the Russian Federation that is aimed at:

- civic education of Russian residents,
- preservation of the heritage of the ancestors and its use as one of the resources for upbringing and education,
- organization of the continuity of generations in the field of cultural norms and traditions,
- guaranteeing citizens' access to information, cultural values, that is, to the cultural resources of our country.

In 2020, Federal Law 273-FZ “On Education in the Russian Federation” underlines that the most important goals of education are “to form and develop patriotism and citizenship (sense of belonging) among students, to respect the memory of defenders of the Fatherland and the exploits of heroes of the Fatherland, for law and order, a person of labor and the older generation, mutual respect, careful attitude to the cultural heritage and traditions of the multinational people of the Russian Federation” [2, p. 33–34].

Being a humanitarian discipline history is a very effective subject for the education of schoolchildren in various fields and dimensions. The most implemented areas include: civil, multicultural, moral and patriotic education.

### **1. Implementation of civic education**

Civic education is one of the most important elements in the Russian education system. Worthy civic qualities should be developed from early childhood. This can only be implemented on the basis of values (spiritual bonds of civil society). The basis of civic education is the introduction of such values as tolerance, respect for human dignity and human rights. In this regard, history as a school subject is a very effective means of civic education, since it informs students about the development of Russian society's values throughout its history. The discipline provides a wide field for the interaction of the past with the present, makes it possible to trace how the values of society arose and transformed, and allows us to identify legal, political and universal values on the basis of which civic education is formed. [8, p. 334–335].

### **2. Implementation of multicultural education**

Multicultural education is an opportunity to resist the appearance of hatred in a person's life based on cultural differences and as a preparation for life in a multinational society. The goal of multicultural education is to develop a tolerance required for living and working in a multi-ethnic environment [6, p. 215]. Studying historical events and facts from the past allows solving multicultural problems of the present. The teacher has the opportunity to make students realize the fact that ethnic diversity is the norm in modern society; to foster tolerance, to acquaint students with value-relevant information from the history of the formation of Russia as a state, with facts about the modern realities of Russian civil society; to expand their spiritual and general cultural horizons, to cultivate a conscious attitude to the Fatherland, its history based on historical values and the role of Russia in world history [6, p. 216].

### **3. Implementation of moral education**

Studying the national history is an important means of personal development in terms of spiritual, moral and patriotic aspects. The history of Russia as the history of a unique culture appears to be an endless source of spiritual understanding of human life. The educational capacity of events from the history of Russia can be implemented only on condition of constant, intense and creative work of teachers [7, p. 220–221]. Moral culture can be developed when studying both works of great thinkers and the history of everyday life. The history of everyday life is the history of those people who are ordinary participants in historical events. Every person is an event, and it should be able to see it, and that the analysis of everyday life is very effective in education and training, since it is "extracted" and analyzed by students without anyone's help [3, p. 60]. History has good prospects for moral education. These opportunities can be realized if the students' attention is constantly focused on the spiritual and moral aspects of historical events, they are taught to consider and compare them with the present day [3, p. 62].

### **4. The implementation of patriotic education**

Nowadays, Russians tend to recognize the value of history in a person's life, which results from a long and complicated process of cultural self-determination of the nation. History contributes a lot to the process, and is an important element in the civic education [4, p. 44]. Today, patriotism at the highest level is defined as a strategic paradigm in the education of schoolchildren [5, p. 73]. A characteristic feature of the patriotic education of is the unity of feelings and the analyzed information. Facts and information can affect students' moral development if they are only colored with feelings and experiences. Thus, a story that conveys information about the life of our ancestors and makes students feel interested and worried about the events is an efficient element of patriotic and moral education [5, p. 76]. Patriotic attitudes of students influence their life values and civic position, since the younger generation is a reflection of what the older generation lays in it. Patriotic education effectively coordinates the actions of a person and society, which, in turn, leads to the emphasis of the activities and thinking of young people on patriotism and the modernization of the Motherland [1, p. 222].

Taking into account the above-mentioned aspects a survey was conducted to find the relation between the amount of humanitarian discipline (including history) in a curriculum and the development of moral, cultural and civil qualities of students. Fifty students participated in the survey answering forty-five questions comprising three areas: "Civil and Patriotic education", "Moral education" and "Multicultural education". A half of the students "specialized" in humanities, while another part of students was mostly involved in technical training.

The questionnaire consists of the following statements:

*Civil and patriotic education:*

1. I know the basic rights and obligations of a citizen of the Russian Federation.
2. I am ready and I believe that I am able to defend my Homeland.
3. I take great care of the historical heritage of Russia.
4. I am aware of my responsibility for the future of my country.
5. I'm not particularly interested in what my country lives on.
6. I am aware of myself as a citizen of Russia and an heir to the spiritual achievements of my ancestors.
7. I feel responsible for my behavior in society.
8. I have beliefs about the structure of the world, the position of Russia in it.
9. I am ready to stand up for the weak.
10. I am not particularly interested in patriotism as an ideological concept.
11. I take the initiative in new activities; I stand for creativity and entrepreneurship.
12. I am interested in events in Russia and abroad.
13. I don't have an active civic position.
14. I am interested in the culture and history of Russia.
15. I am involved in historical and patriotic work.

*Moral education:*

1. I believe that it is unacceptable to humiliate the honor and dignity of other people.
2. I believe that it is necessary to show mercy to all living beings.
3. I believe that problems are a personal matter for everyone and I am not ready to help others.
4. I believe that all people are equal.
5. I believe that people should be treated the same way you would like to be treated.
6. I am ready to temporarily give up a number of elements of wealth if this improves the well-being in my country (environment).
7. I am ready to help a living being, even taking into account the fact that this will negatively affect my well-being.
8. It seems to me that excessive attention to the problems of people who are in difficult situations is wrong.
9. It is necessary to adhere to the moral norms accepted by society at the moment in life.
10. I believe that aggression towards a weaker person is evil.
11. I can help those who are weaker than me.
12. In my actions, I am guided, first of all, by personal gain.
13. I must be guided not only by my instincts, but also by my thinking, and rely on mercy in my activities.

14. I don't have to respond with evil for evil.
15. I want all members of the society in which I live to live well.

*Multicultural education:*

1. I am able to interact with representatives of other cultures.
2. I respect representatives of other cultures.
3. It seems to me that the globalization of the modern world and the integration of different cultures is wrong.
4. I want and can partially understand the specific system of perception, cognition, thinking, and actions of representatives of other cultures.
5. I am not interested in what the representatives of other cultures that surround me "live" with.
6. I think it is important to establish interaction between representatives of different cultures.
7. I feel my familiarity with the culture of my people.
8. I have an idea of the cultural diversity in the region where I live and accept it.
9. I have a positive attitude to the cultural differences of people.
10. I believe that the difference of cultures affects the progress of mankind (positively).
11. In my free time, it would be interesting for me to get acquainted with the culture of other peoples.
12. I have good friends-representatives of other cultures or I would like to make them.
13. I am not ready to interact with representatives of other cultures.
14. I believe that its multiculturalism and openness to representatives of other cultures have played a huge role in the development of my country.
15. It seems to me that radical and nationalist movements are wrong from the point of view of ideology.

The respondents should rate from 5 to 0 how much they agree with the proposed statement (5 – completely agree, 0 – completely disagree). A certain number of points were awarded for each answer. The answers to questions 5, 10, 13 from the part "civil and political education", 3, 8, 12 from the part "moral education", 3, 5, 13 from the part "multicultural education" were evaluated as follows:

- 0-5 points
- 1-4 points
- 2-3 points
- 3-2 points
- 4-1 points
- 5-0 points.

The remaining responses were evaluated in the opposite way.

The sum of the points scored showed how high is the education level of each student in terms of multicultural, moral and civil areas:

- 75-61 points – a high level of education
- 60-46 points – an average level of education
- 45-31 points – a satisfactory level of education
- 30-16 points – low level of education
- 15-0 points – an unsatisfactory level of education.

Table 1 provides the obtained results.

**Table 1.** Average points for different types of education

|                                               | Civil and patriotic education | Moral education | Multicultural education |
|-----------------------------------------------|-------------------------------|-----------------|-------------------------|
| Training with the focus on humanities         | 64.8                          | 60.7            | 62.4                    |
| Training with the focus on technical sciences | 47.3                          | 51.9            | 54.4                    |

The results of survey prove the statement that humanities (including history) contribute to higher quality of Civil-Patriotic, Moral and Multicultural education. This may account for better awareness of historical and cultural contexts among those students who are more trained on humanities.

In addition, the survey identified seven factors that significantly influenced the worldview of the respondents in each of the 3 spheres. This is:

- Studying history
- Reading literature
- Personal experience
- Viewing news information
- Watching films on humanistic topics
- An example of people around you, authoritative personalities
- Religious beliefs

Regarding civil and patriotic education, the ratio of the most important factors that form the students' worldview (those who study humanities) is as follows:

- Studying history – 44.74%
- Reading literature – 28.95 %
- Viewing news information – 15.79%
- Example of people around you, authoritative personalities – 10.52%

Those who study technical sciences consider “Example of people around them” as the main factor (36.82%) which is followed by “Viewing news information” (28.94%).

The ratio of the most important factors affecting the students' moral worldview (for those who study humanities) is as follows:

- Personal experience – 34.21%
- Religious beliefs – 26.32%
- Viewing films on humanistic topics – 21.05%
- Studying history – 18.42%

The students of technical sciences showed almost the same results, with “Personal experience” being the leader (39.47%), followed by “Religious beliefs” (36.84%), and “Watching films on humanistic topics” (18.42%).

The students studying humanities choose the following key factors influencing multicultural education:

- Studying history – 39.47%

- Personal experience – 36.84%
- An example of people around you, authoritative personalities – 15.79%
- Reading literature – 7.90%

The students studying technical sciences choose “Personal experience” (34.21%) as the key factor of multicultural education, followed by “Viewing news information” (31.58%), and “Studying history” (26.32%).

Moreover, the respondents noted that studying history influenced significantly their civic and patriotic views:

- Studying the Great Patriotic War (heroic defense of the years of heroes and the work of home front workers).
- Studying resistance to militia interventionists during the “Troubles”. – study of the history of resistance of Russian cities (especially Kozelsk and Ryazan) to the invasion of the Tatar-Mongols.
- Studying triumphant battles under the command of: Alexander Nevsky, Dmitry Donskoy, Fyodor Ushakov and Pavel Nakhimov.

According to the respondents, studying the Second World War (the history of concentration camps, the life of Soviet people under occupation) has a significant influence on the moral education. The subject also affected multicultural aspect of education providing facts about:

- Various peoples from Russia participating in large and significant wars for Russia.
- Foreign masters’ contribution to the Russian culture and science development in the 15th–18th centuries.
- The assistance of the Transcaucasian peoples to restore the infrastructure of the previously occupied territories after the Great Patriotic War.

Thus, the publication review and the survey results draw us to a number of conclusions. Firstly, educating a person with high moral quality and civic awareness is a challenging and key goal of the contemporary school. Secondly, History as a subject, due to its complex nature, contributes to many aspects of personality development. It facilitates formation and development of students’ personal values, their moral, cultural, social and patriotic features. Finally, analyzing, comparing and assessing historical facts and events develop students’ critical thinking and analytical skills.

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**УБЕДИТЕЛЬНОСТЬ МАРКЕРОВ АРГУМЕНТАЦИИ  
В АНГЛОЯЗЫЧНЫХ СТАТЬЯХ ЕСТЕСТВЕННО-НАУЧНОГО НАПРАВЛЕНИЯ  
PERSUASIVENESS OF ARGUMENTATION MARKERS  
IN ENGLISH RESEARCH ARTICLES OF NATURAL SCIENCE**

**Аннотация.** В статье речь идет об убедительности аргументации, которая проявляется через маркеры аргументации в статьях научного дискурса. Исследование направлено на изучение убедительности аргументации в англоязычных научных статьях естественно-научного направления. Автор дает определение аргументации, убедительности, убедительности аргументации и также приводит классификацию маркеров аргументации в зависимости от их функции в тексте. Анализируются примеры из англоязычных статей, в которых используются такие маркеры аргументации, как пример, пояснение и вывод. В результате исследования выявлены маркеры аргументации, которые способствуют убедительности аргументов. Акцент делается на создании убедительности аргументации через аргументативные маркеры в англоязычных научных статьях естественно-научного направления.

**Abstract.** The article deals with the persuasiveness of argumentation, which is expressed by the markers of argumentation in the articles of scientific discourse. The research is aimed at studying the persuasiveness of argumentation in English-language scientific articles of the natural science. The



author gives a definition of argumentation, persuasiveness, persuasiveness of argumentation and also gives a classification of argumentation markers depending on their function in the text. Examples are taken from English-language articles, where such types of argumentation markers as example, explanation and conclusion are used. As a result, the study identifies argumentation markers that contribute to the persuasiveness of arguments. The emphasis is on creating persuasiveness of argumentation through argumentative markers in English-language scientific articles of the natural science.

**Ключевые слова:** аргументация, убедительность, убедительность аргументации, маркеры аргументации.

**Key words:** argumentation, persuasion, persuasion of argumentation, argumentative markers.

Argumentation is a procedure when the speech is aimed to establish the truth, but primarily when the speaker wants to convince the addressee to accept a certain opinion [1, p. 9]. This phenomenon is to produce a specific impact on the recipients' minds through linguistic means typically used in accordance with the principles of persuasion. According to R. Petty, persuasion results in changing someone's mind. Although persuasion can be used to change many things such as a person's specific beliefs. The most common target of persuasion in the psychological literature is a person's attitudes [8, p. 137]. Thus, the purpose of an argumentative statement is to transform the knowledge that is being doubted to the certain public way of thinking [3, p. 75].

The persuasiveness of argumentation is the correctness and infallibility of reasoning, compliance with the rules of conducting critical discussion, social norms and conventions [4, p. 17]. The persuasiveness of the argument (convincing – unconvincing) depends, first of all, on the content of the argument. The personal characteristics of the speaker affect the level of persuasiveness (more convincing – less convincing) of this argument.

Among the content factors, the most important when trying to convince an opponent are the logical correctness of the argument and the imagery of the vocabulary [4, p. 25]. This might be achieved by the correct use of argumentation markers. According to the definition of P. Borodenzov, argumentation markers or argumentative markers are lexical units that function as implicators of logical chains and provide a link between the components of argumentation (thesis, argument, conclusion) [2, p. 11].

The types of markers directly depend on their functioning in the text. So, they can be classified based on the structure of a scientific article and the fixed components of its argumentation:

- justification – involves the introduction of causation, the presentation of information for further confirmation or refutation – *however, also, moreover, nowadays*;
- objection – the process of entering arguments, which reflects the opposing nature of the argument and a wide linguistic range of possibilities for expressing counterarguments – *whereas, in the other hand, but, unfortunately, nevertheless*;
- explanation – aimed at confirming the truth of the text, verifying the text and terms – *in this case, such as, almost, in addition to, due to*;
- example – used to introduce additional information to more fully present the information to the interlocutor – *for example, for instance, on the other hand*;
- conclusion – expression of investigative relations regarding the study – *thus, finally, overall, in conclusion, generally* [2, p. 15].

Let us analyze some of the examples. The examples were taken from articles of natural science ranging from 2019 to 2021.

1) *It is true that the freedom of the state is what actualizes free spirit. However, the state's freedom systematically requires that of individuals* [5, p. 28].

The marker “*however*” is an objection marker. Thanks to it, the author highlights that state freedom is not only a free spirit, it requires each person’s freedom. So, the author uses this marker in order to convince the readers of his point of view.

2) *A total of 64.3% knew who is able to act as a patient’s legal guardian, where needed, and 72.8% knew who holds legal guardians to account. Finally, while determining when a patient should stop driving is often problematic in clinical practice, 77.3% of respondents knew who has the authority to decide whether or not a patient has the capacity to drive a vehicle* [6, p. 3].

The marker “*finally*” belongs to conclusions markers. In this example, it proves once again that most responders know who is to make a decision and who has the option to drive a vehicle. Thanks to this marker, the author makes the reader to take his point of view.

3) *It is easy to see that  $\alpha \neq 1$  (otherwise the constraint  $f(\sigma, \alpha) \leq 0$  will not hold). Therefore, all arguments for  $\alpha \neq 1$  in Case 1 apply here* [9, p. 9].

The author uses the objection marker “*therefore*” to assure others that they use all arguments for a  $\alpha \neq 1$ . So, thanks to this marker, the author explains and supports his theory/position.

4) *Generally, when biomass is exposed to thermal heating, inhibitors and acids are released from the pretreated biomass. These by-products could interfere with the downstream enzymatic hydrolysis. Hence, diverse hydrothermal phases are applied to circumvent these inhibitory compounds, such as steam explosion, steam treatment, and liquid hot water (160–240°C)* (Ruiz et al., 2008) [7, p. 1123].

The author uses marker of conclusion “*hence*” to make readers believe that different types of diverse hydrothermal phases are used to evade these inhibitory compounds. This marker helps the author to persuade people that this statement is right.

5) *Lignocellulosic biomass can also be pretreated physically and chemically in combination. For instance, milling, a physical pretreatment, can be performed alongside alkali pretreatment to enhance pretreatment efficiency* [7, p. 1119].

Using the marker of example “*for instance*” author explains us that to enhance pretreatment efficiency we can perform both milling, a physical pretreatment and alongside alkali pretreatment. Thanks to this marker, the people are more convinced of the authenticity of this statement [10, p. 2].

To conclude, the success of achieving the goal of argumentation is to influence the opponent’s opinion. It is stated that the markers given above are used for the purpose of persuasion. Besides, as the argumentation depends on the structure of the article, the conviction is mainly expressed in markers of example, explanation and conclusion. As a result, it is detected that these markers emphasize the above-mentioned opinion of the author, highlight the correctness of his reasoning. Also, markers of example, explanation and conclusion persuade readers of the reliability of the examples given.

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# **РОЛЬ ВИРТУАЛЬНОГО МУЗЕЯ В ШКОЛЬНОМ ОБРАЗОВАТЕЛЬНОМ ПРОЦЕССЕ ROLE OF THE VIRTUAL MUSEUM IN THE SCHOOL EDUCATIONAL PROCESS**

**Аннотация.** Анализируются особенности формирования цифрового поколения. Подчеркивается, что молодежная когорта, являясь «цифровыми аборигенами», не только проводит много времени в сети, а и подвергается влиянию со стороны цифровой среды. Обращается внимание на появление «новых» агентов социализации как реальных (блогеры и т.д.), так и виртуальных. Акцентируется внимание на особенности процесса формирования личности в современную эпоху, что находит выражение в концепции «виртуальной социализации». Рассматриваются психологические особенности и социально-образовательные механизмы процесса вхождения пользователя Интернета в социокультурную

среду. Отмечается, что данная особенность позволяет осовременить образовательный процесс в школе, трансформировать методы обучения. Авторы приходят к мысли, что в сложившихся условиях виртуальный музей может способствовать сохранению исторической памяти и поддержанию российской идентичности.

**Abstract.** The features of the formation of the digital generation are analyzed. It is emphasized that the youth cohort, being “digital natives”, not only spends a lot of time online, but is also influenced by the digital environment. Attention is drawn to the emergence of “new” socialization agents, both real (bloggers, etc.) and virtual. Attention is focused on the features of the process of personality formation in the modern era, which is expressed in the concept of “virtual socialization”. The psychological characteristics and socio-educational mechanisms of the process of entering the Internet user into the socio-cultural environment are considered. It is noted that this feature makes it possible to modernize the educational process at school, transform teaching methods. The authors come to the conclusion that under the current conditions a virtual museum can help preserve historical memory and maintain Russian identity.

**Ключевые слова:** Интернет, виртуальная социализация, цифровое поколение, молодежь, виртуальный музей, школьный образовательный процесс, методы обучения, историческая память, Россия.

**Key words:** Internet, virtual socialization, digital generation, youth, virtual museum, school educational process, teaching methods, historical memory, Russia.

The rapid spread of the Internet in the modern world is becoming increasingly important in the life of society and man. Transforming the habitual way of life and ways of communication, the World Wide Web today acts as an important factor in the formation of personality, its attitude to historical events, its state, etc.

At the beginning of 2021, more than 4.66 billion users of the World Wide Web (more than 65% of the world's population) were registered. The Russian Internet audience amounted to 124 billion users – 85% of Russians, and the number of daily Internet surfers increased from 28% in 2011 to 62% in 2018 (among young people aged 18 to 24, this fraction exceeds 95%) [4]. There is a steady trend of growth in the number of Internet audience both in the world and in our country [3]. Therefore, the role of the Internet is constantly growing, the range of opportunities available using the Network is rapidly expanding.

The Internet is also actively used in the educational process today, allowing solving a number of problems related to the expansion of the cultural and educational space of students, the implementation of the principle of visibility, regardless of the temporal and spatial location of the student, teacher and the object being studied. This becomes possible not only because of the technical equipment of educational institutions, the priority here is the specifics of the Internet audience, which is rapidly getting younger – children, teenagers and young people, mastering new technologies, are much faster than adults to join them.

In fact, we are talking about the so-called “digital generation” (the term appeared in foreign studies in the early 2000s). Reasoning in the categories of Mark Prensky's analysis [6], two types of users can be conditionally distinguished: digital immigrants and the digital generation. The differences of which are rooted in the respectively inactive/active use of digital devices and resources, the specifics of learning and working with information. If digital immigrants, meaning some representatives of the older generation (mostly 65+), are uncomfortable and difficult to live in the era of the information and communication revolution, then representatives of the digital generation, on the contrary, are in their own place. The digital generation has grown up in the world of computers, mobile phones, video cameras and video games, and, consequently, is actively immersed in the digital environment. This causes a change in the person himself, namely: cognitive processes change,

multitasking and fast work with information develops, etc. Life in the dual world of the real and virtual gradually leads to the blurring of one and the other, that means existence in a mixed world for a modern person, especially young people, becomes the norm [2, p. 8].

According to the data of the all-Russian study in 2019 [5], teenagers in the age range from 14 to 17 years have practically no special prohibitions and restrictions for accessing the Internet. Because of this, 45% of respondents spend from 1 to 4 hours online every day, and 39% spend more than 4 hours. The key motivation of users of this age cohort is social interaction, psychological relaxation, entertainment, self-presentation, as well as the development of a number of skills. The Internet environment is beginning to influence the formation of a young personality more and more than parents or teachers, meaning traditional social institutions that cause socialization are partially destroyed or undergoing transformation, and their place can be taken by various kinds of “new” agents of socialization, both real (bloggers, etc.) and virtual, which focuses on the psychological features and socio-educational mechanisms of the process of the Internet user's entry into the socio-cultural environment.

Previously, the only way to become familiar with the culture and heroic past of their country was through the assessment of the material heritage of various epochs and periods through personal visits to museums and other cultural institutions. In order to maintain the national and cultural foundations of the life of the Russian people, control the “places of memory”, due to the possession of the potential for the preservation of tangible and intangible cultural heritage, a “new” tool – a virtual museum – can play an important role in this process.

It should be noted that according to Werner Schweibenz, the concept and terminology of a “virtual museum” existed even before the advent of the Internet [7], while the focus of scientific reflection of foreign researchers since the mid-90s of the twentieth century has been directed to the study of the effects of multimedia and hypermedia applications and the use of autonomous computers. However, the advent of the World Wide Web allowed not only to present museum information online in a different way, but actually “took the museum beyond” buildings and limited spaces. For example, objects from several collections and even several museums can be converged into a virtual space without the limitations of physical infrastructure, providing users with wider access to museum content. Moreover, the use of these technologies has shown that virtual reality is able to produce an environment of complete “immersion” of the individual, creating a presence effect that correlates with the user's motivation to physically visit the museum.

According to the Russian museum encyclopedia, a virtual museum involves the submission of information on an electronic medium about a museum that exists in reality (museum sites) or only in the network space [1]. The remote use of museum collections for educational purposes in an educational environment can allow the teacher to choose the most appropriate material for the lesson, plan the most appropriate learning strategy that involves obtaining knowledge at the expense of museum information available in a digital environment, etc.

The key task in modern conditions is to preserve historical values, which can be helped by a virtual museum, the creation of which opens up wide opportunities for an unlimited number of people without reference to the territory and physical space. This technology allows Internet users to get acquainted and work with archival materials stored in departmental museums with limited access, in family archives of relatives, etc. Free access to visualized historical and cultural values allows you to “transfer” the user (viewer) to the era, adding interactivity, to conduct excursions as in ordinary reality. In this context, a virtual museum can become an educational tool for a modern youth cohort.

Thus, the socialization of the digital generation takes place today, suggesting fundamentally different mechanisms for the inclusion of the individual in the socio-cultural reality, based on digitalization. This specificity determines the transformation of the perception of the youth cohort, its cognitive capabilities. Therefore, the use of “museum pedagogy” methods in the educational process contributes to the preservation of historical memory, the maintenance of intergenerational value continuity, the transfer of knowledge about the traditions of the heroic past of the country, the formation of a certain attitude to its historical past in the context of the information and communication revolution. Virtual museums can act as “new” agents of socialization. Acting in the

format of the actual perception of youth, virtual expositions and/or virtual museums can become not only repeaters of knowledge about the heroic pages of the history of our Motherland, in particular about the Great Patriotic War, but also act as a tool for the formation of civic identity and preservation of the historical memory of youth.

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## **ВОСПИТАНИЕ ЭКОЛОГИЧЕСКОЙ КУЛЬТУРЫ У СОВРЕМЕННЫХ СТУДЕНТОВ DEVELOPING ENVIRONMENTAL CULTURE AMONG MODERN STUDENTS**

**Аннотация.** В статье рассматривается проблема развития экологической сознательности и воспитания экологической культуры среди современной молодежи. Поднимаются вопросы необходимости сознательного потребления природных активов и улучшения осведомленности молодых людей об альтернативных материалах и ресурсах, безвредных для экологии. Проводится анализ работ, посвященных изучению социально-ориентированных практик по сохранению и восстановлению биоресурсов окружающей среды. Кроме того, в статье дается обоснование тому, что экологическая культура формируется постепенно и в длительной временной перспективе, включает в себя понятие экологической грамотности и компетентности. Также в статье исследуется уровень экологической культуры среди молодежи, в частности среди современных студентов, даётся и интерпретируется анализ полученных данных о том, насколько осведомлены молодые люди об экологической культуре.

**Abstract.** The article deals with the problem of developing environmental consciousness and fostering environmental culture among the current generation of young people. The authors also bring up the question of the necessity of conscious consumption of environmental assets as well as the issue of improving awareness among modern young people with regard to alternative materials and resources that are eco-friendly. There is given an analysis of scientific works devoted to studies of socially orientated practices aimed at conservation and restoration of biological resources. Moreover, the article gives the grounds for the opinion that environmental culture is formed gradually and in the long term, includes ecological literacy and ecological competence. The article also studies the level of environmental culture of young people, in particular modern students, as well as gives analysis and interpretation of the data obtained.

**Ключевые слова:** воспитание, экологическая культура, экологическая грамотность, экологическая компетентность.

**Key words:** fostering, environmental culture, ecological literacy, ecological competence.

Dealing with global environmental problems on a daily basis has been a problem for a couple of past centuries. Nowadays issues which relate to the need to save natural resources are the most urgent. Despite the fact that variable international organizations are trying to solve global ecological problems, competent attitude to this problem is a critical aspect. This attitude should be demonstrated by each human of any age group. Fostering ecological culture should begin as early as possible: from the moment of coming to the kindergarten and up to studying at the high school.

Currently while preparing students of various specialties, educational process presupposes little attention to this problem. The ecological culture of an individual is formed step-by-step, gathering little pieces of ecological literacy and ecological competence with the development into a

big harmonic jigsaw puzzle. Obviously, we cannot imagine our existence without scientific and technological progress, but we are able to develop an understanding of how important it is to save the natural resources of the city, region and country in which people live, study and work.

Ecological culture as a culture for the whole mankind is not formed chaotically. According to the Oxford Learner's Dictionary culture means the customs and beliefs, art, way of life and social organization of a particular country or group [3].

Based on the content of this definition, interpretations to the concept of "ecological culture" were given by many authors of scientific works.

According to Olga Kolosova, the author of the article "Positive ecological practices formation as condition of ecological crisis overcoming", ecological culture is defined as a body of knowledge in the field of general, applied and social ecology, a positive attitude towards events that affect the environment and active environmental protection [2]. A.P. Adonina considered ecological culture as a common human culture, which is its fundamental principle [1].

Due to the definitions mentioned above, it can be argued that ecological culture is an integrative definition which becomes the result of the upbringing of moral values and behavior rules in a person, achieved through training and practical activities with aim at acquiring the necessary knowledge, skills and abilities to preserve and increase the necessary natural resources.

An important task of higher education is the formation of an ecological culture among students who receive a teaching profession, since later it is precisely such specialists who will form the ecological worldview of the younger generation to the greatest extent.

Students and teachers from different universities raised in their works issues related to the need to form an ecological culture among the entire humanity, for example, students majoring in different fields and people who have become professional specialists. Good examples of mentioned works are popular ecological books, scientific articles and methodological developments by Rachel Carlson [4], Olga Kolosova [2], Mark Vellend [5]. These works are dedicated to highlighting issues related to the development of human ecological consciousness, proposed effective methods of teaching and upbringing with the aim at forming a competent attitude towards the environment among all people, especially youngsters.

Environmental dedication, competence and culture include knowledge of the fundamental rules of behavior to preserve natural wealth of the world, the ability to use and increase natural resources, understanding the conscious development of such modern human's personal traits as moral values, responsibility, devotion, humanistic orientation towards nature and society in the whole.

There was developed a questionnaire which included questions to study the level of environmental literacy, competence and culture. The aim of this questionnaire is to study the ideas of students about the importance of environmental problems. In total, sixty-two people took part in the survey.

To determine the level of environmental literacy there were prepared questions about knowledge of global problems, the meaning and content of the Red Book, as a reference book and set of rules for the conservation of endangered species of flora and fauna, the activities of volunteer movements involved in the preservation and rescue of the natural environment.

Environmental competence was studied using questions and tasks aimed at identifying specific skills and abilities to preserve the environment among youth, for example: "What is the decisive factor for you for buying clothes / products?", "How to dispose of a classic thermometer with mercury inside?" etc.

Ecological culture was studied using questions that determine the conscious behavior of modern students with regard to the nature. This block had such questions as: "If you see a passer-by on the street throws a plastic bottle into a flower bed, what will you do?"; "Do you read literature related to environmental problems?"; "How often do you participate in activities devoted to the nature conservation?"; "Do you volunteer to preserve natural resources of our city and region?"

Based on the results of the survey it was revealed that environmental competence is at a low level among the majority of today's students.



Judging by the students' answers whose results were referred to the average level, there is a lack of theoretical knowledge and specific practical skills. These students have never participated in volunteer movements to collect garbage in public places, are not interested in the activities of the "green" public groups and act as consumers in relation to the environment.

Nevertheless, the results of the survey revealed that a considerable part of students (52.2%) are motivated for a conscious attitude and conservation of nature and would like to become participants in social activities to preserve environment in the city and the region.

Speaking about conclusions of the research it is worth mentioning that ecological culture is an integrative concept that becomes the result of developing moral values and rules of behavior, which can be achieved through training and practical activities aimed at acquiring the necessary knowledge and skills to preserve and increase natural resources. The ecological culture of a modern individual goes through certain stages of development: ecological literacy, ecological competence, a conscious attitude to environmental problems, development of positive personal habits such as dedication, accuracy, curiosity, etc. According to the results of the survey it was revealed that 15.0% of respondents are at a low level of environmental literacy; 37.0% are on average level and 48.0% are at a high level. 19.0% of respondents are competent in terms of interaction with the nature; 37.0% of respondents are at the average level by this indicator. A high level of ecological culture was achieved by 52.0% of respondents.

The results of the study have demonstrated the urgent need of teaching environmental disciplines among today's students. The content of such teaching should involve all levels of environmental culture development from environmental literacy to environmental competence.

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**ИЗУЧЕНИЕ ИНОСТРАННОГО ЯЗЫКА ЗАГРАНИЦЕЙ:  
ПРЕИМУЩЕСТВА И НЕДОСТАТКИ  
LEARNING A FOREIGN LANGUAGE ABROAD:  
ADVANTAGES AND DISADVANTAGES**

**Аннотация.** Данное исследование посвящено проблеме изучения иностранного языка в языковой среде. В работе описывается метод полного погружения, его история создания и преимущества перед другими. Отмечается, что изучение языка в языковой среде имеет больше положительных сторон, среди которых, прежде всего, скорость и глубина освоения языка. Цель исследования состоит в анализе достоинств и недостатков такого метода обучения и его отличия от традиционных методов изучения. Практическим материалом исследования послужил личный опыт изучения автором китайского языка в Китае по программе государственных грантов. Автор на основе своего опыта выделяет такие преимущества изучения иностранного языка за границей как более быстрое преодоление языкового барьера и, следовательно, более быстрое освоение иностранного языка на высоком уровне, более глубокие лингвокультурологические знания, развитие навыков работы в поликультурной команде, получение сертификатов международного образца. Среди недостатков изучения языка за границей автор отмечает высокую стоимость обучающих программ и их ограниченную доступность, высокую психологическую нагрузку, связанную с отрывом от родной лингвокультурной среды, плотным учебным графиком и быстрым темпом освоения материала.

**Abstract.** This research is devoted to the issue of learning a foreign language in the native linguistic environment. The full immersion method, its history and advantages in comparison with other methods are described. It is noted that learning a language in the native language environment has more positive aspects, among which the main ones are the speed of mastering the language and the depth of language knowledge. The purpose of the study is to analyze the advantages and disadvantages of this method and its difference from traditional methods. Practical part of the research is based on the author's personal experience of learning Chinese in China in the framework of the program of state grants. The author, judging from her personal experience, points out the following advantages of learning a foreign language abroad: quick overcoming of the language barrier and consequently faster mastering of the language reaching a high level, deeper linguocultural knowledge, developing skills of teamwork in multicultural team, receiving international certificates. Among disadvantages, the author notes high cost of educational programs and their restricted availability, significant psychological load connected with the separation from native linguocultural environment and tight academic schedule.

**Ключевые слова:** изучение иностранного языка, языковая среда, китайский язык, метод погружения, государственные гранты.

**Key words:** studying a foreign language, native language environment, the Chinese language, method of immersion, state grants.

Nowadays in modern globalized world knowledge of foreign languages is not just a desirable skill but rather a necessity. More and more people, especially young ones, who are only building their careers or receiving education, know at least one foreign language, often more than one. The world without borders, Internet communication, a wide variety of language courses and educational programs for studying a language abroad contribute to the active studying of foreign languages by young people. Relevance of the topic is predetermined by the importance of learning foreign languages for modern people in general and the opportunity of studying languages abroad, in particular. The purpose of this study is to analyze advantages and disadvantages of learning a foreign language by immersion into the natural language environment abroad.

M. Berlitz was the first to write about the importance of full immersion into the language for the most effective mastering of it. Berlitz method is a natural way of studying a language. It has little syntactic content, a lot of dialogues, retellings and oral practice. A student learns new words and immediately makes sentences, like a child studies his native language.

Studying a foreign language in the language environment, particularly in the country where it is spoken, is one of the easiest ways to master a foreign language quickly and effectively at a high level. Professor I. A. Orekhova remarks: "In the language environment <...> the most influential factor is the environment itself: it teaches, enlightens, stimulates linguistic activity, solution of communicative, educational problems..." [3, p. 38]. Advantages of the immersion method are also noted by the foreign scientists. For example, Pr. Steve Kauffman said: "I think we all know that language immersion is an ideal way to improve in a language. What do we mean by language immersion? Obviously, it means being immersed in the language. In other words, hearing the language, reading the language, speaking the language, being covered head to foot, so to speak. If we think of the analogy with swimming or being immersed in water, language immersion is being immersed in the language. Normally, this can be the situation if you live where the language is spoken. If you live surrounded by the language, you're immersed in the language" [4]. Among other advantages of learning a foreign language abroad scientists also point out the speed of study and the profoundness of the knowledge acquired.

Being in a linguistic environment allows one not only to learn a language, but also to acquire a broad linguocultural knowledge. The French academic J. Lasserre said: "It is the information about culture that constitutes the main wealth of education. A teacher should not be limited to narrow linguistic goals. Without culture, language learning becomes impoverished and boils down to learning phonetic, lexical and grammatical phenomena" [2, p. 218]. Therefore, being in the country of the target language allows one to get deeper and more well-rounded education.

Studying a foreign language abroad is gaining popularity in Russia in the recent decade. According to the survey conducted by the All-Russian Center for the Study of Public Opinion, about half of the Russians would like their children and/or grandchildren to be educated abroad, considering such education to be modern, high quality, and prestigious [1].

Today Chinese is becoming increasingly popular among foreign languages in Russia. It is spoken by over 1.4 billion people in the world and it is an official language in such countries as China, Singapore, and Taiwan. It is also one of the 6 official and working languages of the United Nations and the Shanghai Cooperation Organization. For the popularization of the Chinese language and help to foreign students in learning it, the Chinese government has developed a system of grants and state support. There are more than 5000 grant programs available, including those in Russia: full grants, partial grants, language year grants, grants for studying in schools, colleges, undergraduate, graduate and doctoral programs, etc. Currently 289 universities in China offer a variety of academic programs in science, engineering, medicine, economics, agriculture, law, management, pedagogy, history, literature, philosophy, etc. According to the Ministry of Education of the People's Republic of China,

19,239 students from Russia studied in all types of programs in 2018. By this indicator, Russia is the 6th largest exporter of students to the PRC [5].

In the practical part of my research I would like to describe my own experience of learning Chinese in China within the framework of one of these educational programs, highlighting the advantages and disadvantages of this way of studying a foreign language.

My story of learning Chinese started with a government grant. In the 11th grade, I entered an open competition among secondary school pupils around the world, and four months later I received an official invitation from Jiangsu University. It said that I had won a “1+4 grant” that paid for my language studies and later for any major at the university, health insurance and accommodation for 5 years. So immediately after school, I opened an educational visa and went to China to start learning a new language.

My program was for people who had never studied Chinese before. During the year, my group not only studied hieroglyphs and learned to write and read them, but also got to study history, culture, and traditions of China. This allowed us not only to learn the language, but also to immerse into the atmosphere of this country. My language group consisted of 6-7 people from different countries, with only one person from each country. Inside the subgroup only English and Chinese were the languages of conversation. This allowed us to immerse into the language environment as much as possible. We spoke only Chinese to each other and the teachers already from the first lesson. In my group there were students from Africa, Canada, Bangladesh, Poland, and Australia. After classes we made projects presenting the culture and traditions of our countries in Chinese. It was good for practicing vocabulary and enriching our wordstock.

Curriculum of the first year included language study from the basic level and extra modules on history and culture of the country. Forty classroom hours a week were devoted to studying grammar, developing reading and writing skills, and four hours a week were devoted to extra modules. During the first month of the program we were supposed to learn 150 basic hieroglyphs and basic grammar. In three months we had to cover 600 words and learn how to make dialogues about everyday situations. After the first year, all international students were expected to complete the HSK (International Standard Certification in Chinese as a second language) level 4. Students had to be competent in speaking in Chinese on a wide variety of topics, be able to communicate fluently with native speakers, and know at least 1200 words. This correlates with B2 level of the Common European Framework of Reference for Languages (CEFR).

After successful completion of this exam, students could choose the major for which they would study for the next four years finally receiving bachelor's degree. In 2017, I successfully passed the language exam and received the certificate, and in 2018, I chose the Department of Oceanology of Shanghai University for my undergraduate studies. The bachelor's curriculum for foreign students was the same as for the Chinese students, however, foreigners did not study communist history and did not participate in military training camps.

But the winter of 2019, when all international students were on a long winter vacation, entry into the PRC was closed due to coronavirus and our education program was canceled due to the inability to study full-time. Until now, it is not possible to enter China with an educational visa.

Now I have an HSK 4 certificate and testimonials from the university. These testimonials do not allow me to return to the bachelor's degree programs, but they give me an advantage if I apply for a master's degree at the same university with the Russian bachelor's degree.

So, based on my personal experience of participating in an educational program of learning a foreign language abroad I can highlight the following advantages:

1. very quick immersion into the language environment, which allows faster overcoming of the language barrier and the transition to communication in the foreign language than in the conditions of traditional foreign language learning in the classroom or in language courses in the native country;
2. obtaining deeper knowledge of the culture of the country, as well as the exchange of cultural experience between students from different countries;
3. developing skills of working in a multicultural team;

4. receiving international diplomas and certificates, which provides young professionals with wider career opportunities.

However, there are some disadvantages which I can point out:

1. high cost of the program (4.3 million) and limited number of grants;
2. high psychological burden associated with moving to another country, separation from family and native linguistic and cultural community, and quick adaptation to living and studying in a new environment;
3. high academic load and high learning rate.

In conclusion, I can say that the programs of foreign language learning by immersion into the natural language environment abroad allow you not only to quickly and effectively master the literary, business, academic language, but also get acquainted with its colloquial variant, dialects etc, they help to become an expert in the language and a sought-after, promising young professional. Such programs allow you to get a valuable experience of international cultural interaction and cultivate autonomy and responsibility. However, participation in such programs is expensive; in addition, participants must be psychologically ready to living in a foreign country and to a busy schedule.

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**РУССКИЙ ЖЕСТОВЫЙ ЯЗЫК КАК СОВРЕМЕННАЯ ПЕДАГОГИЧЕСКАЯ  
ТЕХНОЛОГИЯ В РАБОТЕ С ДЕТЬМИ  
С ОГРАНИЧЕННЫМИ ВОЗМОЖНОСТЯМИ ЗДОРОВЬЯ  
RUSSIAN SIGN LANGUAGE AS A MODERN PEDAGOGICAL TECHNOLOGY IN  
WORKING WITH SPECIAL NEEDS CHILDREN**

**Аннотация.** В статье рассматриваются педагогические методики обучения детей с ограниченными возможностями здоровья. Значительное внимание уделяется языку жестов, который в основном используется для общения с глухими или слабослышащими людьми. Известно, что язык жестов включает жесты, мимику, а также язык тела. Показано, что игровые технологии, артикуляционная гимнастика, пальчиковая гимнастика, биоэнергопластика, работа с песком и др. играют важную роль в обучении детей с особыми потребностями.

**Abstract.** The article focuses on pedagogical methods of teaching special needs children. Considerable attention is paid to the sign language that is mainly used by people who are deaf or have hearing impairments for the purpose of communication. Sign language is known to include gestures, facial expressions, as well as body language. It is shown that game technologies, articulation gymnastics, finger gymnastics, bioenergoplastics, work with sand, etc. play an essential role in teaching special needs children.

**Ключевые слова:** педагогическая технология, жестовый язык, дети с ограниченными возможностями, биоэнергопластика, мелкая моторика.

**Key words:** pedagogical technology, sign language, special needs children, bioenergoplastics,

Sign language is an independent language consisting of gestures, facial expressions, as well as body language. It is mainly used by people who are deaf or have hearing impairments for the purpose of communication.

Communication is known to be of two types such as verbal and non-verbal. The former refers to the use of words, while the latter refers to communication that uses gestures, facial expressions, eye contact, body language, intonation. Both verbal and non-verbal communication can be spoken and written. It is important to remember that effective verbal communication cannot be fully isolated from non-verbal communication [1].

There are people with a broad range of physical and cognitive communication disorders: issues with articulation, stuttering, word finding, semantics, syntax, phonics, vocalization, and swallowing. These disorders have a variety of causes, such as autism, stroke, brain injury, hearing loss, developmental delay, a cleft palate, and psychological issues, among others. In order to prevent, assess, diagnose, and treat speech, language, and swallowing disorders modern pedagogical technologies can be used [2].

Pedagogical technology is a consistent, interconnected system of teacher's actions aimed at solving pedagogical problems, or a systematic sequential implementation in practice of a pre-designed pedagogical process. This article describes pedagogical technologies used to help special needs children.

Special needs kids are usually characterized by insufficient level of cognitive activity; severe disorders of the emotional and volitional spheres; reduced level of efficiency and independence.

For children with speech pathology game technologies are widely used to develop breathing. To begin with, if the child speaks poorly, then work on speech development should be started with the development of breathing. Various games and exercises help develop breathing. Correct (physiological) breathing will help the child learn to speak calmly, fluently, and slowly. Some breathing exercises also of great help to teach the kid pronounce certain sounds correctly.

Furthermore, articulation gymnastics can be used in order to help mastering the correct sound pronunciation. Articulation gymnastics is known to be a set of exercises for organs involved in speech education: the tongue, lips, cheeks, lower jaw. It should be performed daily. You can give this for 3-5 minutes a day. Do all the speech exercises in front of the mirror. To make the process more interesting, exercise is often included short poems and illustrations.

Moreover, finger gymnastics can be used to develop fine motor skills. Fine motor activities are an important part of any child's curriculum and learning experience. The development of motor skills is carried out while doing different exercises or playing games with fingers, using nursery rhymes, fairy tales, and a variety of poetic texts. Finger games develop not only coordination, dexterity and accuracy of the hands, but also the child's brain, stimulate creativity, imagination and speech, promote better hand-eye contact coordination, and increase blood circulation.

For a more successful development of fine motor skills, teaching children the techniques of self-massage and relaxation of the hands and fingers is used as the final exercise in the classroom. Finger massage has a beneficial effect on the development of fine motor skills, on the mobility of fingers, it intensifies tactile sensations and relaxes the nervous system [3].

Additionally, there are gaming technologies aimed at automating and differentiating the delivered sounds. These games help automate and differentiate the sounds set, develop mental processes (like attention, memory, thinking), and develop fine motor skills of the hands.

Among special needs children there are non-verbal kids. Communication is bigger than speech, though. There are different ways to help a non-verbal child communicate, e.g., using gestures, signs, assistive technology and words. The method of visual modeling is widely used. A visual support refers to using a picture or other visual item to communicate with a child who has difficulty understanding or using language. Visual supports can be photographs, drawings, objects, written words, or lists.

To achieve faster results while working with special needs children and to make classes more entertaining and exciting, bioenergoplastics can be used as well. This technology that has recently become widespread is a combination of movements of the hands and articulation apparatus. It helps develop coordination of movements and fine motor skills and has an extremely beneficial effect on brain activity of special needs children.

It is worth noting the work and tasks with sand. Sand-play is hands on work and is a good adjunct to talk therapy with children who often cannot express their inner feelings in words. This technology facilitates the natural capacity for healing [4].

Nowadays, the following methods of teaching deaf and hard of hearing children are of primary importance:

- Oral method – method of instructing the deaf by which they are taught to speak and to understand the speech of others by lip-reading. In this technique, the main emphasis is on forming the child's oral speech, the need to speak. The development of written language also plays an important role. New words are presented in writing, orally, and fingerspelling. Some children show quite good results with this kind of training, but for the majority it is an overwhelming task. In this case, there is a certain result, but it is limited to the automatic memorization of familiar phrases, i.e. there is no progressive development.

- Sign method – the technique which is practically never used in its pure form. This method is based on sign language (a certain gesture denotes a word) and fingerspelling (finger alphabet, where each letter corresponds to a certain finger mark). This technique is more easily accepted by children with hearing impairments, but the problem is that oral speech must also develop.

- Bilingual method that has been introduced in Russia since 1992. It assumes the joint use of the above techniques, i.e. pure oral and sign method. Its essence is as follows: when children read a word, they must demonstrate to the teacher its sign designation. This is necessary in order for the speech-language pathologists to see that the kids have understood the word being pronounced. In addition, this practice allows to combine a gesture and a word, which contributes to the formation of a conscious concept.

In modern practice, other methods of working with deaf and hard of hearing children can also be used:

- Methodology for compensatory preschool education. Groups are formed at the age from 1.5 to 2 years (no more than 6 people). The training takes place for the period of 5 years. Children are in such groups the whole week, while parents can communicate with them on weekends. The advantage of this method is that the child is constantly engaged in the educational process under the supervision of specialists.

- Methodology of E.I Leonhard. It implies the active participation of the family, where the necessary speech environment is created. This implies corrective work with a teacher of the deaf, the use of hearing aids. This technique is designed only for those parents who have the opportunity to spend a lot of time studying with their children at home.

- Verbotonic method. It is based on the development of auditory and tactile perception of sounds. It is typically designed for children with residual hearing.

It is important to understand that every child is individual. Subsequently, the methods and technologies of work with children, especially with special needs kids, should be selected on the basis of each specific case.

Thus, the currently existing technologies for teaching special needs children are constantly being improved, adapted, which contributes to the expansion of the abilities of future teachers and speech-language pathologists.

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**ОРГАНИЗАЦИЯ ТВОРЧЕСКОГО ОБЪЕДИНЕНИЯ «ВОЛШЕБНЫЙ КЛУБОЧЕК»:  
ОСНОВНЫЕ АСПЕКТЫ  
ORGANIZATION OF THE CREATIVE ASSOCIATION “MAGIC SKEIN”:  
MAIN ASPECTS**

**Аннотация.** Данная статья освещает преимущества декоративно-прикладного искусства, такого как вязание, макраме, вязание крючком и др. Участие в таких занятиях удовлетворяет естественный интерес к прикладному искусству, развивает художественные, умственные и творческие способности и таланты. В результате был создан специальный курс «Вязание крючком. Макраме». Его цель – развитие художественных и творческих способностей детей. В статье представлены основные характеристики курса, а также его типы и планируемые результаты.

**Abstract.** The article aims to illuminate the advantages of decorative and applied art such as knitting, macramé, crocheting, etc. The participation in such activities satisfies a natural interest in applied art, develops artistic, mental, and creative abilities and talents. As a result, a special course called “Crocheting. Macramé” has been created. Its aim is to develop artistic and creative abilities of children. The main characteristics of the course as well as its types and planned results are discussed.

**Ключевые слова:** преподавание, ученики, макраме, вязание крючком, тематический план.

**Key words:** teaching, students, macramé, crocheting, thematic planning.

Nowadays there are a large number of classes for children having creative abilities. Knitting or weaving classes are the least common, although they are very useful, especially at school age. Why are they beneficial, one may ask? And why are such classes created at all? And what are the purpose of the creative association? That's the main objective of the given article.

It worth mentioning that knitting is a favorite and widespread craft. It has many advantages. Having comprehended its secrets, it is possible to make not only high-quality, but also unique toys, napkins, tablecloths and much more without much expense, to make your home cozy and beautiful.

The knitting process itself has a calming effect on a person. And it is not surprising that recently not only adults, but also children have become interested in knitting. Consequently, the task is not just to attract, but also to teach children this wonderful craft, to make it accessible to everyone [1, p. 320].

The organization of extracurricular work with students allows you to satisfy a natural interest in applied art, helps educational institutions in solving aesthetic education and promotes better assimilation of program material [1, p. 335].

Teaching students to appreciate the loveliness in our life and in art is only one side of fostering love for the beautiful. The other side is the development of artistic and creative abilities and talents, the desire to express their feelings to transform reality. It is the creative activity progress in which the goal of aesthetic education is perceived. Decorative and applied art will help to fill the vacuum in aesthetic education of students dissatisfied with the quality of their work, practically stop working. But it is better not to wait for this moment, but to start such classes that will help from the first attempts to prove themselves individually, thereby continuing the development of techniques for working in this direction. This is especially important for those children who “do not know how to work” and thus are deprived of the impact of such an effective means of aesthetic education as macramé classes [3, p. 86].

In the process of learning, students develop a fantasy and learn to see something fantastic, fabulous, mysterious in the simple and ordinary. In the classroom, children independently begin to create unusual, and most importantly, unique twice “masterpieces”, putting all the beauty both external and internal, sophistication and purity [4, p. 124].

Work in this direction plays a huge role in the educational process. In such classes, children learn how to make and memorize different types, location and quality of knots, learn about the macramé trends, while expanding their horizons and understanding traditions. The art of “wicker” decor has reached its peak in society. Decorated in various ways and types of planters in halls, hotels are very fashionable. In modeling clothes, fashion designers complement their “creations” with macramé-style woven handbags, purses, various necklaces, pendants, the decoration of which is very attractive and versatile, and most importantly – individual [2, p. 56].

That’s why I consider crocheting and macramé to play a key role in developing pupil personality. A special course was created in order to teach pupils the basics of macramé and crocheting. The main objectives of the creative association “Magic skein” are the formation and development of creative abilities, independence, cognitive activity of students in the process of mastering the techniques of crocheting and macramé. Considering the works of the decorative art, children penetrate deeply into creativity, striving to create something of their own, personal. Each student is given the opportunity to really discover the magical world of macramé, to show and realize their creative abilities in the fabrication of products in modern macramé technology.

The relevance of the creative association “Magic skein” lies in the fact that it reflects the general orientation towards the popularization of needlework, the introduction of new modern trends in its traditional forms. It also improves communication skills and acquires the ability to carry out joint activities in the process of mastering the program.

Crocheting and macramé will help younger students to develop, using the resources of their psyche. Based on the fact that both hands are actively involved in working with crochet and yarn, as well as threads for weaving, it can be assumed that both hemispheres will be more active than when working with one hand, and that such activity will contribute to the disclosure of the possibilities of the right and left hemispheres, flexible interaction of the hemispheres in the work of the whole brain, and, consequently, the development of mental abilities [4, p. 201].

One of the most important educational tasks of this creative association is the formation of independence as a stable character trait of children. The solution of this problem is carried out by creating a specific environment stimulating the independent cognitive activity of the child.

The creative association “Magic skein” has an additional general education program, which consists of the main program and operating one.

The main program called “Decorative and Applied Arts. Crocheting. Macramé” presents: information map, explanatory note, educational and thematic planning, and content of the educational program, methodological support and a list of sources used.

From the basic general education program, you can learn the following items about creative association “Magic skein”:

1. It is designed for one academic year.
2. Children are taught on the basis of schools 24 and 35, that is, classes are located in these schools.
3. In the first semester the children are taught crochet, while in the second semester – macramé.

Operating program has two sections.

Section one describes the number of children in the group, their age, class schedule and duration, and the goals of classes.

The planned results of the teacher’s joint work with students indicate what collective work will be done during the school year. For example, for the New Year, children advised to make things from a song called “New Year’s Miracle”. The aim of teamwork is that children knit details, and the teacher collects these details into a single work.

In addition, groups must pass certification to check the development of the knowledge received during classes. Pupils are to pass a test in order to get a certificate. There can be three tests per academic year. At the end of the first semester, there will be a crochet test, in May – macramé test, and the third – final testing.

At the end of the year, students will submit their best works for the final exhibition.

Calendar and thematic plan are scheduled for each lesson for the whole academic year. It specifies the date, the number of working hours, and the topics of the lesson. This plan takes into account weekends and holidays.

In the second section, one can see what educational work is carried out with students. For example, on October 16, the children are told about ecology and energy conservation.

In addition, the second section also includes the work with parents – these are parent meetings and communication with parents on the social network, e.g., to answer questions and send important information.

Also, my students took part in the contest “Crimean souvenir”. I’m proud of what works we did with them: “Hope of Sailors”, “Crimea Gifts”, “Black Sea Dolphin” and “Mr. Crab”. According to the results of the competition, we received prizes: first place for the work “Hope of Sailors” and second place for “Mr. Crab”. The students received diplomas and gifts.

In conclusion, it is worth mentioning that the educational process in the society is very interesting and fun, and most importantly – productive. Even at the beginning of the school year, the children did not know what crocheting and macramé were, and by the end of the year they were already working wonders with their own hands. It’s so nice to see that the kids like going to class, that they and their parents are grateful for all the things I do for them. This is why I love and why I am proud of my work!

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## **ВЛИЯНИЕ МУЗЫКИ НА ИЗУЧЕНИЕ АНГЛИЙСКОГО ЯЗЫКА INFLUENCE OF MUSIC ON LEARNING ENGLISH**

**Аннотация.** Данная статья будет интересна специалистам, которые рассматривают различные способы изучения иностранного языка. В статье говорится о воздействии музыки как на эмоциональное, так и на физическое состояние человека, которые имеют прямую связь с изучением английского. Кроме этого, в статье затрагивается вопрос о положительном влиянии зарубежных песен на мотивацию при обучении иностранному языку. Ведь в современном мире тяжело представить жизнь без песен и музыки, которые играют не только развлекательную, но и обучающую роль. Такая методика изучения актуальна и для детей, и для взрослых, каждый может найти песни на свой вкус, что сделает обучение более приятным. Именно при заучивании песен пополняется словарный запас, улучшается восприятие английской речи, а также меняется произношение.

**Abstract.** This article will be of interest to professionals who are considering different ways to learn a foreign language. The article talks about the impact of music on both the emotional and physical state of a person, which have a direct link to the study of English. The article also touches on the positive influence of foreign songs on the motivation of learning a foreign language. Because in the modern world it is hard to imagine life without songs and music, which play not only a recreational, but also a learning role. This method of learning is relevant to both children and adults, everyone can find a song he likes, which will make learning more enjoyable. It is when learning songs that the vocabulary increases, the perception of English speech improves, and the pronunciation changes.

**Ключевые слова:** музыка, английский язык, влияние, песни, навык, дети.

**Key words:** music, English, influence, songs, skills, children.

Many English learners have to spend a lot of time learning complex grammatical structures and understanding where to use them. Others, because of this, completely lose interest in learning languages. Therefore, it is necessary to find an actual way of gaining knowledge for various age groups, which helps upgrade language skills.

Music plays a significant role in the modern world; it is an integral part of people's life. Almost all people listen to music every day, that is why some people claim that music is something ordinary and it hasn't influence on person. But in fact, music has a strong impact on person's emotions, mood, behavior and his/her moral world. Listening to music is a brilliant way to express feelings, pick up your spirits and just relax. Apart from that music helps us in learning different languages, especially English music:

1. Teaches to distinguish words in a stream of speech.

To distinguish between individual words in a stream of coherent foreign language speech is not an easy task for beginners. Music helps you learn how to split a sentence into individual words, which in general significantly improves listening skills.

2. Helps to get used to the melody of a foreign language.

Research shows that people who listened to a foreign language before starting to learn a language do better than those who have not heard the sound of this language before. Listening to music in a foreign language helps to get used to the sound of the language and its melody.

3. Enlarges vocabulary.

In songs, familiar vocabulary is found in a new contextual environment, which helps to activate it. The songs often contain proper names, geographical names, the realities of the country of the target language, poetic words. This contributes to the development of students' sense of language, knowledge of its stylistic features.

4. Improves listening skills.

Your listening skills will certainly develop and you will begin to understand English better. The greatest progress in listening skills will be noticeable only if you, despite the often fast pace of singers, listen to every word and try to grasp the meaning of the composition, and not just enjoy the melody and rhythm. In songs, usually a fast tempo of speech, listening to it, trying to distinguish words and phrases, we improve the perception of foreign speech.

Studies have shown that children who have studied music perform better than others in various tasks related to listening to audio. Because these children are good at focusing on the sounds they hear, they may be better at processing language and voice sounds. It is easier for them to distinguish the sounds of speech, to recognize voices and the emotions they express, and in general it is easier for them to separate speech from noise. The ability to isolate individual objects or sound sources in the complex world of sounds involves not only the auditory systems of the brain, but also motor and visual signals. They are important to distinguish the desired voice from background noise. For a lot of obvious reasons, musicians do it better. Their hearing aids are better trained and finer tuned, and they also find it easier to focus on specific sounds and filter out excess noise.

5. Practice pronunciation.

Songs improve your pronunciation skills. By listening to the song and singing along (preferably out loud), you develop your speaking skills. It is a very natural and enjoyable process to develop your English-speaking skills. Over time, you will see that you have become more responsive to questions from interlocutors and began to think less about what you would like to say. You learn to think in English. Listening to compositions with visual support on the lyrics is a great way to follow the pronunciation, find out the sound of certain words, and learn to perceive continuous speech. By reading the lyrics, you develop your vocabulary. Good songs contain a lot of useful words and phrases that you can use in your everyday conversation. At first, students will have to read the text more than once, as a result of which the spelling of words will automatically be memorized, which contributes to the improvement of grammar [3, p. 23].

6. Allows you to better understand the culture of the countries of the target language.

Music is a source of information about the culture of the countries of the target language. Listen to the lyrics of the songs, and you will understand what the people for whom this language is

native think and feel. The work on the song will undoubtedly enrich the students with information of a regional geographic nature, help to familiarize them with the culture of the country of the language being studied. After all, songs in English reflect the peculiarities of life, culture and everyday life of the people of the country of the target language. In addition, a passion for music in the target language will give you a topic for conversation in an informal setting with native speakers.

7. Helps to learn everyday vocabulary and colloquial expressions.

The lyrics use the very vocabulary that is useful in everyday communication. These are adjectives and verbs for describing feelings and actions, various "fashionable" words, colloquial expressions. A lot of useful words can be gleaned from songs if you choose the right repertoire.

8. Learn English anywhere.

Songs and lyrics are easy to find on the Internet, so this is one of the most affordable ways to improve your English. In addition, you can save these materials to your phone or tablet and work with them on the road, in a car, or at the post office.

Songs can be used for various purposes:

1. Some songs can be used to practice grammar structures. All grammatical phenomena of the English language can be found in songs: plurals of nouns, numbers, prepositions, adverbs, modal verbs, degrees of comparison, possessive, types of tenses, etc.

2. You can dramatize the song.

3. Convey the content of the song in your own words.

4. Change direct speech to indirect [1, p. 4].

With the help of musical material, we are given the opportunity to easily create a psychologically comfortable environment in English lessons. The influence of music on the psychological processes of the human body has been perfectly studied by psychologists, doctors, teachers and is widely used in teaching not only foreign languages. To create a psychologically comfortable, creative atmosphere in the lesson, musical and song material is involved.

Songs contribute to the aesthetic education of students, team building. Thanks to music in the classroom, a favorable psychological climate is created, psychological stress is reduced, language activity is activated, emotional tone is increased, interest in learning a foreign language is maintained;

Songs provide an opportunity to relax, take a short break from routine educational activities in the lesson. Songs are not forgotten, unlike the grammatical structures that disappear from the head at the end of the lesson, songs can live a long time and become part of someone's culture.

5. Stimulates mental activity.

The so-called "Mozart effect" is a well-proven scientific fact. Listening to classical music, in particular, Mozart, increases the efficiency of intellectual activity, memory and concentration. Classical music helps to better assimilate grammar, memorize new words and their spelling. It is not necessary to study a foreign language with music – it is enough just to listen to it before class for at least 5-10 minutes.

The use of songs in English lessons increases motivation for learning the language, ensures the assimilation of lexical and grammatical material and maintains students' interest in educational process.

Music is capable of influencing human cognitive processes, as evidenced by the work of many authors. Research indicates hemispheric activation in cognitive tests. The work of the parts of the brain affects thought processes, attention and speech. Consequently, musical activity allows you to achieve an improvement in interhemispheric interaction, developing a person's creative abilities. Music promotes analytical thinking skills [2, p. 48].

A study of the works of many authors has shown that music affects the parts of the brain, contributing to the development of cognitive abilities and improving the psycho-emotional state of a person. It should be noted that music contributes to creative thinking, increased performance during physical activity. Musical accompaniment enhances the work of the brain, promotes the development of analytical thinking and speech.

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**НАВЫКИ СОЦИАЛЬНОГО ВЗАИМОДЕЙСТВИЯ У ДЕТЕЙ  
С УМЕРЕННОЙ УМСТВЕННОЙ ОТСТАЛОСТЬЮ, ТЯЖЕЛЫМИ  
МНОЖЕСТВЕННЫМИ НАРУШЕНИЯМИ РАЗВИТИЯ  
В СОДЕРЖАНИИ ОБРАЗОВАНИЯ  
SOCIAL INTERACTION SKILLS IN CHILDREN  
WITH MODERATE MENTAL DELAY, SEVERE MULTIPLE  
DEVELOPMENTAL DISORDERS IN THE CONTENT OF EDUCATION**

**Аннотация.** Люди с умеренной умственной отсталостью и тяжелыми множественными нарушениями очень часто физически и экономически зависят от других людей, находятся на попечении государства и родителей. На современном этапе развития образования социализация детей с ограниченными возможностями здоровья является актуальной проблемой, которую решают на государственном уровне. Федеральный государственный стандарт для детей с ограниченными возможностями здоровья предполагает акцент на социализации, который базируется на максимальном расширении их жизненной компетенции за счет формирования доступных навыков коммуникации, социально-бытовой адаптации. В данной работе рассматриваются навыки социального взаимодействия у детей с умеренной умственной отсталостью, тяжелыми множественными

нарушениями развития в содержании образования. Выделяются те предметные результаты, которые связаны с навыками социального взаимодействия, раскрывается их содержание.

**Abstract.** People with moderate mental retardation and severe multiple disabilities are very often physically and economically dependent on other people, are in the care of the state and parents. At the present stage of the development of education, the socialization of children with disabilities is an urgent problem that is being solved at the state level. The federal state standard for children with disabilities assumes an emphasis on socialization, which is based on the maximum expansion of their life competence through the formation of accessible communication skills, social adaptation. This paper examines the skills of social interaction in children with moderate mental retardation, severe multiple developmental disabilities in the content of education. The subject results that are associated with the skills of social interaction are highlighted; their content is revealed.

**Ключевые слова:** умственная отсталость, нарушения развития, интеллектуальные нарушения, образование, социальное взаимодействие.

**Key words:** mental retardation, developmental disabilities, intellectual disabilities, education, social interaction.

The relevance of this research topic is due to the fact that social interaction skills are a necessary part of socialization. At the present stage of the development of education, the socialization of children with disabilities (HH) is an urgent problem that is solved at the state level. People with moderate mental retardation and severe multiple disabilities represent a special social group that very often physically and economically depends on other people, are in the care of the state and parents.

The object of the research is the skills of social interaction in children with moderate mental retardation, severe multiple developmental disorders.

The subject of the research is the skills of social interaction in children with moderate mental retardation, severe multiple developmental disorders in the content of education.

According to the international classification of diseases 10 revision, mental retardation is a state of delayed or incomplete development of the psyche, which is primarily characterized by impaired abilities that manifest themselves during maturation and provide a general level of intelligence, that is, cognitive, speech, motor and social abilities [3].

Children with severe multiple developmental disabilities (hereinafter referred to as TMPD) are a heterogeneous group of children with two or more developmental disabilities. That is, this is a special group of children that combines mental retardation with other disorders: sensory (vision, hearing), speech, emotional-volitional, autism spectrum disorders, disorders of the musculoskeletal system. Due to organic damage to the central nervous system in children with TMHR, the emotional-volitional sphere, cognitive, communicative, general and fine motor skills suffer.

The federal state standard for children with disabilities assumes an emphasis on socialization, which is based on the maximum expansion of their life competence through the formation of accessible communication skills, social adaptation [2].

Based on the definition of children with TMND, it is worth saying that children of this category cannot study according to standard programs due to various combinations of disorders and their severity, therefore, special individual development programs (hereinafter referred to as SIDD) should be developed for them, which are created on the basis of individual the capabilities of the child, and the content of the program is more focused on the formation of life competencies. [5, p. 34].

The life competencies of children with moderate mental retardation and TMNR are certain knowledge, skills and abilities necessary for a child in everyday life, which are formed through communication, social adaptation, socialization and the acquisition of life experience [1, p. 279].



In the approximate adapted basic general educational program for children with mental retardation (intellectual disabilities) option 2 (hereinafter referred to as PRAOOP UO (IN) option 2), the special educational needs of children with moderate mental retardation and TMNR are spelled out, which include: expansion of the educational space, introduction subjects, mastering various types of communication, the inclusion of psychological support, which includes the interaction of the student with other teachers and peers, the establishment of interaction between the family and the organization, the formation of elementary skills of self-service, etc. [4]. The program notes that the result for children with TMHR is the normalization of life. Normalizing the life of a child with TMNR means obtaining a set of competencies that will allow the child to independently solve everyday problems, include it in the life of society, etc.

The SIPR prescribes personal results, the achievement of which is inextricably linked with life competence. In PrAOOP UO (IN) 2 options are described the expected personal results that are important for the study: social and emotional participation in the process of joint activities; the formation of a positive attitude towards others; mastering available social roles; development of ethical feelings, benevolence, emotional and moral responsiveness, understanding and empathy for the feelings of other people, etc. [4].

Considering the expected subject results prescribed in the PrAOOP UO (IN) 2 options, we can see that almost every subject is aimed at the socialization of children. We have identified those subject outcomes that are associated with social interaction skills:

Language and speech practice include the ability to use the acquired lexical and grammatical material for communicative purposes; the ability to use the means of communicative communication: gestures, views, etc.; motives of communication: cognitive interests, communication and interaction in various types of children's activities; the ability to make contact, maintain and complete it using non-verbal and verbal means, adherence to generally accepted rules of communication.

The surrounding social world includes ideas about the social roles of people, rules of behavior according to social roles in various situations; experience of constructive interaction with adults and peers; the ability to follow the rules of conduct in the classroom and in extracurricular activities, interact with adults and peers, choosing an adequate distance and forms of contact that are appropriate for the age and gender of the child; the ability to build relationships based on support and mutual assistance, the ability to empathize, sympathize, show attention; the ability to interact in a group in the course of educational, game, and other types of available activities.

Music includes the ability to show adequate emotional responses from joint musical activities; striving for joint and independent musical activity.

Visual activity includes the willingness to interact in creative activity together with peers, adults.

Technology. Profile work includes the need to actively participate in joint activities with others, aimed at their livelihood, social development and help to loved ones.

So, social interaction skills are an integral part of a number of life competencies that characterize a child's personal development in the educational process. Social interaction skills can be observed in such life competencies as social and emotional participation in the process of joint activities; mastering available social roles; development of ethical feelings, benevolence, emotional and moral responsiveness, understanding and empathy for the feelings of other people, etc. These competencies are formed in the content of such subject areas as speech and speech practice, the surrounding social world, music, visual activity, technology.

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## **К ВОПРОСУ ОСВЕДОМЛЕННОСТИ ШКОЛЬНИКОВ О СИСТЕМЕ ОБРАЗОВАНИЯ В СОЕДИНЕННЫХ ШТАТАХ АМЕРИКИ TO THE QUESTION ON THE STUDENT AWARENESS OF THE U.S. EDUCATION SYSTEM**

**Аннотация.** Являясь примером высокой конкурентоспособности на рынке мировых образовательных услуг, образовательные учреждения соединенных штатов Америки, а также вся американская система образования в целом становится образцом высокого уровня образования, стремление к которому является фактором становления высококвалифицированного компетентного в своей области специалиста. Наше исследование посвящено вопросу осведомленности школьников о системе образования в Соединенных Штатах Америки. В рамках работы авторы рассмотрели историю становления и развития образовательной системы Соединенных Штатов Америки; представили современную структуру образования в США; с помощью анкетирования определили информированность школьников о системе образования в США, а также выявили основные источники информирования.

**Abstract.** As an example of high competitiveness in the global educational market, the educational institutions of the United States, as well as the American educational system as a whole, become a model of high level of education, the pursuit of which is a factor in the development of a highly qualified competent specialist in his field. Our research focuses on the issue of students'

awareness of the educational system in the United States. Within the framework of the research, the authors considered the history of formation and development of the educational system of the United States of America; presented the modern structure of education in the United States of America; determined the awareness of students about the educational system in the USA using questionnaires, as well as identified the main sources of information.

**Ключевые слова:** система образования, США, осведомленность, источники информации, школьники.

**Key words:** system of education, the USA, awareness, sources of information, pupils.

The United States of America is one of the international leaders in higher education abroad. According to statistics, the literacy rate in the country is 99%, and among 250 first persons of various countries, 12% studied at U.S. universities. The largest number of foreign students are trained in the United States. The United States can serve as an example of a highly competitive educational market.

The history of the formation of the U.S. education system began in the first decades of the 17th century when the English began to colonize North America. In the seventeenth century, it was necessary to hire teachers to teach children reading, writing, arithmetic, and the Law of God in the newly created cities. This was followed by a requirement to establish free high schools in towns to prepare students for university studies. In 1636 Harvard University was founded in Massachusetts, and in 1693 William Mary University in Virginia. In 1776, on the eve of the Revolution, there were fourteen colleges in America; by 1800 twenty more had been added. The school retained elements of classical education and taught the trades that were essential to the development of the new nation. The European system of education became the basis for American education. As a result, by the middle of the nineteenth century schools were already teaching such subjects as Latin, animal husbandry, arithmetic, and housekeeping [7]. In 1862, the Morrill Act was adopted, which made changes in the educational process. Under this law, states were given public land to build educational institutions. In these institutions, vocational training classes were held later. The number of such institutions increased and thus this practical approach led to the creation of the modern state universities. In 1834, Pennsylvania established a completely free school system that was funded by the state. By the end of the Civil War in 1865, education at all levels became generally available and anyone who wanted it could do so. At the end of the nineteenth century, the school became the main state organization, along with the court and the church. In the late 1960s, the U.S. underwent a reform of the curriculum, which was changed to meet the requirement of the students. The high school decided to experiment: they reduce the number of hours for reading, writing, and arithmetic, and emphasize subjects that students could choose for themselves. However, national tests showed that, as a result, students lost many of the skills they had learned, and this was cause for alarm.

In the mid of 1970s the trend began to return to the traditional system. Many states began to test the skills of students who were graduating from high school. The emphasis on core subjects increased in the 1980s due to the understanding of the need to provide students with some knowledge in technical areas such as electronic computer technology and communication systems. The importance of traditional technical and humanity subjects increased.

In the last decade of the 20th century, most states increased the number of subjects that were required for a high school diploma. As a result, the U.S. concluded that a complete education should be available to everyone, from kindergarten to university.

The educational system of the United States has four classic stages: pre-school (Pre-School), elementary (Elementary School), secondary (Middle School), and higher education (High School). Higher education in the United States has its own additional system, which may differ from state to state.

Pre-school education is the first stage of the education and upbringing system in most countries of the world. The purpose of preschool education and training is the harmonious

development of children, the formation of socialization skills that is life in society. The standards of upbringing and education in preschool establishments are in the competence of the state.

The first level of preschool education in the United States (Pre-School) includes nursery groups for very young children (Nursery), and also childcare centers or day schools. Some of them operate 24 hours a day. They are usually for profit. There are also corporate childcare centers for employees' children and religious childcare centers run by churches. All-round development of children and staging of oral speech are the main tasks set by the teachers of American preschools. In such centers, there is no educational program. Children play, perform skits, read aloud literary works, and do modeling, drawing, and dancing.

The year of preparation for school (Kindergarten) – the first stage of the public-school system, preparatory class. Education for American children is free and is funded by the state. There are also private preschool centers. In preschool classes, the teacher puts a focus on adaptation to the environment and interaction with each other, which helps children feel psychologically comfortable in school. During this period, active learning of writing, reading, and counting begins.

Also, in the United States, the International Preschool Curriculum is a program that does not divide children into streams. This program illustrates all values of the American educational system: tolerance, openness, development of leadership qualities and abilities [5].

Elementary School is for children from six to twelve years old and includes grades one through five. Students are divided into ability classes to develop their individual talents. The division is based on special IQ tests. All subjects are taught comprehensively by one teacher (some states provide lessons by different teachers after the 4th grade) except for physical education and art [6]. Depending on the test results, teachers emphasize one subject or another in their teaching. In elementary school there are classes for gifted children and classes for retarded children – the level of homework and depth of subjects depends on it.

In Middle School, obligatory subjects are math, English, science, social studies and physical education. Students can choose which subjects to study from the 8th grade onward. These subjects are usually foreign languages, art, or technology.

In High School, students may take several additional classes. These are current subjects, which are useful for entering universities to high demand specialties: foreign languages, computer graphics and Web design, computer science, robotics, journalism, cinematography, theatrical art.

The minimum school board requirements for graduation: 2 years of mathematics, 4 years of English, 2 years of natural sciences, and 3 years of social sciences. After passing the final examinations all students, receive a High School Graduation Diploma. Those students who wish to study subjects in which they plan to specialize at university can go to the 13th grade – Advanced Placement. Good grades give priority for admission to prestigious universities in the United States.

At the end of high school, students will take the SAT (Scholastic Aptitude Test) [4]. There are two versions of SAT I (reasoning test) and SAT II (subject test). The first one (SAT I) lasts 3 hours and is based on questions that test the knowledge of arithmetic, reading comprehension and essay writing. The second test (SAT II) aims at determining the applicant's knowledge in a specific subject area. The first level is necessary for admission to a regular university or college, and the second level is necessary for admission to the best universities of the country [3].

According to the charters of the leading universities the goals of higher education in the United States are to promote the growth of knowledge and to develop human potential, with particular attention to creativity and the ability to think critically, which meets the traditional idea of a specialist who not only has exclusively professional knowledge, but also is able to lead a team, think flexibly and creatively assess the situation [1].

There are about 3,700 institutions of higher education in the U.S.: about 1,600 two-year schools and over 2,000 four-year institutions offering full degree programs [2].

Colleges and universities have an academic year that lasts about nine months. The academic year in colleges is divided into two semesters or three trimesters. The grading system, from highest to lowest, consists of A, B, C, D, F. At the end of four years of study, with appropriate grades and

successful completion of the final exam, graduates are awarded a bachelor's degree. Some students may graduate earlier than four years if they attend summer term classes [2].

A feature of the educational process at U.S. universities is that the student is responsible for his or her own learning. A student can take all courses available at a university, regardless of which major he or she chooses. A student can choose to take elective courses at his or her home institution or even at another university. This approach to the formation of curricula made it possible to move away from narrow specialization, contributed to the formation of interdisciplinary approach in mastering scientific knowledge and conducting research work [8].

According to the Russian concept of education, approved by the Russian President, it is necessary to improve the quality of education and increase the competitiveness of universities, which is impossible without improving the quality of education as a whole. The current ranking of the world's universities shows that, compared to the previous year, twice as many Russian universities are included in the top 100 universities in the world. This shows that we are moving in the right direction. However, the leading positions in the rankings belong to American universities, such as Harvard. In our opinion, one of the ways to improve the quality of Russian education, which will allow being equal to the leading educational institutions of the world, is the awareness of students about the educational system in the United States.

For this purpose, using the survey administration software Google Forms, we created a survey, which was distributed to students in grades from 5 to 9 of schools in Sevastopol, Russia. The survey included questions about the age and school of respondents; whether students know anything about education in the United States, where they learned this information, and whether it is of interest to them. Those students whose answers were negative about their knowledge of the U.S. education system were asked to rate their desire to learn something about the U.S. education system on a scale of 1 to 5 (the highest score).

Thirty-one pupils aged from 11 to 16 studying at Sevastopol schools participated in the survey: Engineering school – 9 pupils, School No. 49 – 4 pupils, School No. 32 – 2 pupils, School No. 14 – 1 pupil, School No. 37 – 2 pupils, School No. 8 – 1 pupil, Educational center “Buhta Kazach’ya” – 4 pupils, SPL No. 1 – 7 pupils. The vast majority of students (26 pupils) when asked if they know something about studying in the USA answered positively – 26 pupils. Five pupils who answered negatively to this question showed an average interest in education in the USA – 2.75.

The main source of receiving information mentioned by 13 pupils was YouTube videos, 12 people mentioned movies and TV series, and one person mentioned relatives and friends. No one indicated books as a source of information. When asked if the information they learned about the U.S. education system seemed more appealing, the average response was 4.1 (on a scale of 1 to 5).

As part of the study we looked at the history of the formation and development of the educational system of the United States, whose roots go back to colonization times, got acquainted with the modern structure of education in the United States; examined the history of the formation and development of the educational system of the United States, which, despite some similarities has a lot of differences compared to our educational system. With the help of a created questionnaire, a survey was conducted. The results showed a high interest in the topic of education system of U.S. among high school students, as well as a willingness to increase their knowledge of the topic. The data obtained on the platforms and sources that students currently use to obtain information allows the teachers to perform the selection of resources (YouTube channels, movies, etc.) that students can use to increase their knowledge about foreign education. Since increasing students' awareness of foreign education and peer to the world leaders in this field, in our opinion, will contribute to the development of domestic education.

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**ВЛИЯНИЕ ДИДАКТИЧЕСКИХ ЭЛЕКТРОННЫХ РЕСУРСОВ НА  
ФОРМИРОВАНИЕ ПОЛОЖИТЕЛЬНОГО ОТНОШЕНИЯ**

**МЛАДШИХ ШКОЛЬНИКОВ К ОБУЧЕНИЮ**

**THE INFLUENCE OF DIDACTIC ELECTRONIC RESOURCES ON THE  
FORMATION OF YOUNGER SCHOOLCHILDREN  
POSITIVE ATTITUDE TO LEARNING**

**Аннотация.** В статье раскрыто влияние дидактических электронных ресурсов на формирование положительного отношения младшего школьника к обучению, что считаем одним из условий его успешности. Представлены способы развития собственных мотивов

школьника к выполнению учебных действий в дидактической электронной среде. Рассмотрено свойство электронного ресурса «замечать» малейший прогресс школьника, его успехи в учебе. Показаны возможности электронных средств для создания положительного эмоционального фона учебной деятельности и реализации связи содержания обучения с жизненными реалиями.

**Abstract.** The article reveals the influence of didactic electronic resources on the formation of a positive attitude of a younger student to learning, which we consider one of the conditions for his/her success. The ways of developing a student's own motives for performing educational actions in a didactic electronic environment are presented. The property of an electronic resource is considered to “notice” the slightest progress of a student, his academic success. The possibilities of electronic means for creating a positive emotional background of educational activity and the realization of the connection of the content of learning with the realities of life are shown.

**Ключевые слова:** дидактические электронные ресурсы, младший школьник, начальная школа, положительное отношение, успешность.

**Key words:** didactic electronic resources, junior high school student, elementary school, positive attitude, success.

Improving the quality of education is a priority task of modern education reform. According to the results of the unified state exam, the quality of school education requires significant improvement. At the same time, the main reasons for the insufficient level of knowledge of graduates should be sought in primary school. It is in primary school where the foundation of a student's success at the following levels of education is laid, his/her attitude to learning is formed – the most important factor in the productivity of educational and cognitive activity.

The problem of forming a positive attitude of a student to educational activities refers to those that never lose their relevance and are studied from different angles.

The factors and conditions for the formation of a positive attitude of primary school students to learning are studied in the works of K.E. Andreeva, O.O. Yashnova [3], etc. The authors associate a positive attitude to learning with the presence of school achievements among students and indicate that school successes, in turn, can appear only if there is a positive attitude to educational activities. Success in learning is the basis for the formation of students' personal qualities such as self-respect and dignity.

According to N.F. Talyzina [2], the conditions necessary to maintain a positive attitude of a younger student to educational activities are realized by introducing schoolchildren to solving such cognitive tasks that are associated with cognition of the surrounding world. At the same time, the author insists on the need to obtain such knowledge independently, rather than memorizing it or getting it ready-made.

The attention of researchers is attracted by the definition of the links between the attitude of schoolchildren to educational activities and educational motives (L.I. Bozhovich, G.I. Shchukina, etc.). The works of Sh.A. Amonashvili are devoted to the formation of motives for educational activities to content-evaluating activities. The author emphasizes the need to create such conditions under which students would study on the basis of cognitive interests, which are constantly being strengthened and stabilized. The source of motivation for educational and cognitive activity, according to the author, is the difficulties that arise in the process of assimilation of educational material, and cause the increased work of the “cognitive” forces of the student.

A significant amount of research by psychologists and teachers (A.L. Vygotsky, P.YA. Galperin, M.V. Matyukhina, etc.) is devoted to identifying the causes of failure and maladaptation of younger schoolchildren. The main reasons are the lack of formation of educational motives and methods of educational activity, untimely receipt of assistance when lagging behind, the discrepancy between the teacher's value judgments and the level of expectation of the student himself.

However, it is impossible to avoid the identified causes and ensure the teacher's attention to the needs of the class without the use of modern didactic electronic means.

In the works of N.I. Tolyarenko it is shown that the use of information technologies helps to facilitate the adaptation of a younger student to learning, to form his/her general educational, intellectual skills, to help in overcoming difficulties. Despite the fact that a lot of research has been conducted in this area, there are unresolved issues of forming a positive attitude of younger schoolchildren to educational activities using didactically electronic means [1].

The purpose of the article is to identify ways of using didactic electronic resources to form a positive attitude of a junior student to the learning process.

In our opinion, the main ways of forming a positive attitude of a child to educational activities using didactic electronic resources are:

- development of students' own motives for performing educational activities;
- praise of successful students;
- creating a pleasant emotional background for learning activities;
- realization of the connection of the content of training with the realities of life.

The results of psychological and pedagogical research have proved that the younger school age is malleable for the formation of educational motivation, laying the foundations of skills and desire to learn, forming interest in the way of obtaining knowledge and motives for self-education. Cognitive motives, related to the content of educational activities and the process of its implementation, push the student to systematic educational activities, to scientific and theoretical understanding of phenomena.

The formation of the needs and motives of the student's activity occurs in the process of carrying out the activity itself, therefore, for the emergence, strengthening and development of cognitive motives, the student should be involved in his educational activities and create conditions under which such activities will arouse his interest and bright positive emotions. This is what makes it possible to make didactic electronic resources.

First of all, the student, working with a didactic electronic tool, is unobtrusively involved in scientific and cognitive activity, and not on the direct instructions of the teacher, but on his own desire to solve the situation that arises on the computer screen. Plot design of educational material, actions that unfold with a fairy tale or cartoon character controlled by a student. These actions make the subject knowledge and skills manifest, the ability to use them in new conditions. The combination of educational and practically significant activities for a student (open a picture, help a hero, find a treasure, etc.), gradually develops into an educational motive. This outgrowth is facilitated by the fact that summing up the results of the student's work with an electronic tool, attention is focused on the importance of those knowledge and skills that made it possible to achieve a successful result.

The development of the younger students' own motives for learning is also facilitated by the fact that the tasks offered for solving often have a problematic nature. This is facilitated by the simulated software tools developed for the younger student, with the help of which the student does not remember the facts, but immediately discovers new knowledge by changing the initial conditions, the study of the proposed situation.

An important feature of electronic learning tools is to ensure the variability of the situation offered to the student. The ability implemented in software tools to generate non-repeatable variants of educational tasks that the student will solve according to his own understanding. This makes the usual process of practicing the skills prevailing in elementary school attractive and turns learning into an exciting activity. In addition, electronic resources for younger schoolchildren, as a rule, make it possible to provide a student with a situation of personal choice and thereby put him in an active position - choose a path, solve a problem or read the training material again, gradually complicating training tasks, or immediately transgress to complex ones, determine the number of tasks to solve.

Another significant feature of didactic electronic means from the perspective of our research is the possibility of their "authorization" by a student. We are talking about the possibility of modifying the tool by including materials that correspond to the personal experience of schoolchildren acquired by them in the process of working on the material. For example, photos or



images selected during homework can be included in an electronic resource in electronic resources and used for further work. Such activity will not leave any student indifferent and stimulates his involvement in the process, contributes to the transformation of the student into a full-fledged subject of educational activity.

The technologization of modern society, the habit of using digital devices such as a mobile phone, tablet, the development of an instrumental environment, and the like, enables the student not only to use, but also to develop them. For example, preparing a presentation using your photos does not cause problems for modern children. All this determines the personal attitude of schoolchildren to the studied material.

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**АНАЛИЗ МЕТОДИКИ ПЕДАГОГИЧЕСКОЙ РАБОТЫ В ШКОЛЕ-КОММУНЕ**

**ИМ. Ф.М. ДОСТОЕВСКОГО НА ОСНОВЕ ПРОИЗВЕДЕНИЯ**

**Г. БЕЛЫХ И Л. ПАНТЕЛЕЕВА «РЕСПУБЛИКА ШКИД»**

**ANALYSIS OF THE METHODOLOGY OF PEDAGOGICAL WORK IN THE SCHOOL-**

**COMMUNE NAMED AFTER F.M. DOSTOEVSKY BASED**

**ON THE WORK OF G. BELYKH AND L. PANTELEEVA "THE REPUBLIC OF SHKID"**

**Аннотация.** В статье представлена методика В.Н. Сорока-Росинского, разработавшего собственную систему обучения проблемных подростков с трудным поведением. Его методики

обучения направлены на формирование познавательных и творческих способностей посредством умственного труда и самостоятельной работы учащихся. Игры считаются одними из самых важных, потому что они помогают формировать у учащихся ответственность и моральные ценности. Система, созданная В.Н. Сорокой-Росинским, может стать основой реализации образовательных обучающих стратегий по работе с «проблемными» подростками.

**Abstract.** The article presents methodology of Victor N. Soroka-Rosinsky who practiced his own educational system for troubled teenagers with deviant behavior. His teaching techniques are aimed to form cognitive and creative abilities through mental labour and independent work of students. Playing games is considered to be one of the most important, because they help to form students' responsibility and moral values. The system created by Victor N. Soroka-Rosinsky can become the basis in the implementation of educational training strategies in working with "troubled" teenagers.

**Ключевые слова:** методика, школа-коммуна, ученики, образовательная работа, игра.

**Key words:** methodology, school-commune, students, educational work, game.

"The Republic of SHKID" is an adventurous, partly autobiographical children's book written by Grigory Belykh and Leonid Panteleev after three years of graduation from the school of social and individual education named after F.M. Dostoevsky (School-commune named after F.M. Dostoevsky, or SHKID as abbreviated in Russian). The school was founded by a well-known Soviet educator and psychologist Victor N. Soroka-Rosinsky in 1918 who practiced his own educational system for troubled teenagers with deviant behavior. This closed-type educational institution was one of the first to appear on the territory of the Soviet Union. The occurrence was provoked by the harsh environment that prevailed in the first half of the twentieth century. After the severe upheavals associated with the revolution, many children lost their parents, which led to an increase in homelessness. At that time, this was a problem of particular importance, since the number of homeless children was constantly increasing.

The purpose of education and upbringing in such schools-communes was the upbringing of homeless, antisocial children and adolescents, the development of their desire to transform themselves, the formation of their active life position in work, cognitive and creative abilities through mental labour and independent work of students.

Studying in the "Republic of SHKID" was difficult. In their memoirs, the authors wrote about the established daily routine and schedule of school classes. Every day the pupils had 10 lessons, starting at 10 a.m. and continuing until dinner with a lunch break. Such subjects as Russian, German, Russian and Foreign Literature, Russian History and the History of Ancient Civilizations, Arithmetic, and Geography were studied at school [1].

But it was very hard to find a suitable teaching staff. Previous practice showed that there were no prospects for educational work with street children. As a result, many teachers refused to work with them, and subsequently educators without pedagogical education went into school because of free accommodation and food. But the Shkid students quickly "dismissed" such teachers from the educational institution, skillfully looking for their weaknesses and putting pressure on them.

Physical training, drawing, singing, and dancing were also added to general education subjects at the school-commune. At first, students rebelled against these disciplines, but the school director, V.N. Soroka-Rosinsky, showed the importance and interest of creative classes by his own example and his teaching staff. He managed to organize extracurricular activities of students. The presence of a school newspaper encouraged children to take part in its creation. The students enjoyed it a lot. Meetings of holidays were considered joint events. Also, inside the school there was its own criterion of encouragement and punishment. The main punishments were considered to be food abandonment and refusal to walk. After the appearance of the "Chronicle", the guilty or distinguished students were

fixed in the form of records. A division into 5 groups was also introduced. The first and second group of students were privileged children with excellent knowledge and behavior, the third – average ones who committed minor offenses, the fourth and fifth were penalized and were not permitted to walk outside and get any reward. Redistributions were made every week.

School named after F.M. Dostoevsky was called a “republic” for a reason. There was a special system of self-government: “Here is our school methodology of self-government. Today, monitors are elected according to classes, living rooms, kitchen, wardrobe. Their responsibilities will be the appointment of duty officers, who are selected for a period of one day. This means that all students will be equally involved in the social life of the school” [3]. There was a council of monitors during which discussions of school events and subsequent ways of school development were held together with teachers. At first, the children resisted, that “republic” was called “monarchy”. But over time, the students realized that it was possible to solve any emerging issue or question together. Such type of the “republic” was designated with the help of symbols – the anthem and the coat of arms. The coat of arms of the Republic of SHKID was a sunflower. The results of the democracy organized at school were amazing: the children increased their interest in participating in social life and school construction, they felt like the masters of the school and organized a routine life on their own, appointing monitors, duty officers, with the organization of parliament and their own system of punishments and rewards for distinguished students.

Subsequently, having analyzed the system of educational and training work of the school-commune named after F.M. Dostoevsky, it is possible to distinguish several basic principles of the author’s methodology, which were the guidelines for the director of that school [2]. These principles are also vividly reflected in the autobiographical work of its students.

- The basis of the methodology of educational work with difficult-to-educate children is a team assuming development, setting goals and achieving them. In such a team, a child learns adult life, makes informed decisions, assesses own capabilities, and also acquires social responsibility.

- An equally important aspect of the work is self-government, which raises a sense of responsibility in students. It affects the team work and responsibility to the team.

- Labor education is important. Participation in social work changes the social status and self-consciousness of students, turning them into adult citizens interested in the result of their work.

- The creative development of students should not be forgotten: such disciplines as singing, fine arts, dancing bring up a versatile and integrated person.

- The role of a teacher in the pedagogical process is essential – he /she must be a mentor, an authority, showing a personal example of all those qualities and knowledge formed in students.

- Discipline is not a means of education, but its result. For its formation, regime moments, daily routine, lesson schedule and educational conversations with students are necessary.

- Arranging excursions to theaters, factories, places of glory is an integral part of the educational process in extracurricular time.

“Our task is to cultivate the right habits, when we would do the right thing not because we sat down and thought, but because we can’t do otherwise, because we are so used to it” [3]. It is necessary to form such well-mannered people who will do the right thing not because someone sees their actions, but because they cannot do the wrong thing, as they will be ashamed of themselves.

Let’s consider the main methods implemented at school-commune.

The method of playing games was popular in the “Republic of SHKID”, because the game is a natural need of a growing person in the organization of life and study of pupils. This method has been used in a large number of dramatizations, productions, contests and competitions, in journalistic creativity. And it gave its result: a large number of writers, scientists and artists finished that school.

Such methods of consciousness formation as an individual conversation with students and a debate on moral values, honesty, kindness were also used.

Thus, the basic goals of work at school-commune named after F.M. Dostoevsky were the formation of responsibility through the collective, self-management of students in the process of extracurricular life at school, labor and creative education, the teacher’s compliance with the requirements imposed on students and the reflection of the result of educational work in the discipline.

The main methods used in school are conversation, debate and the method of play. At present, the system created by Victor N. Soroka-Rosinsky can become the basis in the implementation of educational training strategies in working with “troubled” teenagers to form a versatile and integrated person. The methods meet the interests of the society and social basis of the Russian people.

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### **К ВОПРОСУ О РАЗВИТИИ КРИТИЧЕСКОГО МЫШЛЕНИЯ КУРСАНТОВ НА ЗАНЯТИЯХ ИНОСТРАННОГО ЯЗЫКА ON THE CADETS' CRITICAL THINKING DEVELOPMENT AT FOREIGN LANGUAGE CLASSES**

**Аннотация.** Статья посвящена проблеме оценки сформированности критического мышления курсантов первого курса Ярославского высшего военного училища противовоздушной обороны. Авторы обосновывают важность развития критического мышления для будущей профессиональной деятельности офицера российских вооруженных сил. В работе приведен анализ ключевого для исследования понятия «критическое мышление», описаны составляющих данного вида мышления, определены навыки критического мышления. Авторы статьи выделяют три уровня сформированности критического мышления у курсантов первого курса (низкий, средний и высокий) и рассматривают показатели и признаки сформированности критического мышления. Проводится диагностика сформированности умений критического мышления курсантов Ярославского высшего военного училища противовоздушной обороны. Результаты тестирования представлены в

виде диаграммы. Анализ данных показал низкий уровень сформированности критического мышления у курсантов первого года обучения.

**Abstract.** The article is devoted to the problem of critical thinking assessment of the first-year cadets studying in Yaroslavl Air Defense Military College. The authors underline the importance of developing critical thinking for future profession of a Russian Armed Forces officer. The concept of the key term “critical thinking” is considered, the components of this type of thinking are described, skills of critical thinking are defined. The authors of the article identify three levels of critical thinking formation among first-year cadets (low, medium and high) and consider indicators of critical thinking formation. The diagnostic process of cadets’ critical thinking skills studying in Yaroslavl Air Defence Military College cadets’ is described. The results are given in a chart form. The diagnostics results indicated a low level of critical thinking formation among first-year cadets.

**Ключевые слова:** высшее образование, критическое мышление, уровни критического мышления, диагностика, курсанты, дисциплина «Иностранный язык».

**Key words:** higher education, critical thinking, levels of critical thinking, diagnostic, cadets, Foreign language.

In modern conditions, the process of receiving and processing information plays an important role. It is evident that the ability to find, analyze and select information for solving tasks is essential for professional and personal development. It is well-known that these processes are directly related to the thought processes, since the work with the information resources requires an ability to compare, analyze and synthesize. All these operations are related to the main human’s mental functions aimed at “adequate cognition” [1, p. 150].

Different types of thinking are described in the scientific literature, however critical thinking deserves special attention, especially for developing some kinds of competences (e.g. communicative competence) and realization some approaches (e.g. skills approach).

We use critical thinking almost every day in our life, at school, college, and work. Nowadays critical thinking is a widely accepted educational goal because it is a very important life skill. But the question is what critical thinking is considered to be. Generally, it is the process of thinking carefully about a subject or idea. But if we speak about the educational sphere, it is much more [5].

Critical thinking helps a cadet of Yaroslavl Air Defense Military College to determine their own priorities in personal and professional life and take individual responsibility for his choices. This also means:

1. *Level of working-with-information culture is increasing.* Being critical requires to not only gather appropriate data and information but to examine it carefully and question its reliability and authority.

2. *Ability to analyze is forming.* The detailed analysis allows each cadet to search for the information he really needs. Analytical skill is also the ability to deconstruct information into smaller categories in order to draw conclusions and predict the consequences of the decisions made.

3. *Responsibility is growing up.* Cadets sometimes experience difficulties as a result of their inability to see that multiple interpretations of the same data can coexist. Group work or pair work helps to develop not only the methods of working with information, but also motivates cadets to do their best for solving a number of specific problems.

4. *Self-assessment is developing.* Cadets often have challenges with self-evaluation and they feel irresponsible for their actions. Critical thinking is self-directed, self-disciplined, self-monitored, and also means self-corrective thinking.

Critical thinking skills usually include the ability to analyze and synthesize information, find solutions for solving complex tasks, draw logical-sounding conclusions, establish causal relations,

etc. That is why the teaching staff of Yaroslavl Air Defense Military College chooses the tasks directed at:

- improving critical thinking skills in special modulated learning situations;
- forming skills to find out logical errors and give critical review;
- training logical and analytical thinking skills in various scientific fields, practical activities and public life [4, p. 285].

However, it is necessary to determine the initial level of cadets' critical thinking, since the choice of tasks and activities will directly depend on the level at which they are.

Based on the fact that critical thinking is an individual intellectual activity and is also characterized by a high level of perception, understanding, objectivity in terms of the information around us, we have identified three levels of critical thinking (low, medium and high) and the criteria which help us to identify the real cadet's level. The detailed description of each level is given below.

*Low critical thinking level* is characterized by cadets' inability to estimate their performance and prove their point of view, provide arguments, identify deliberately misleading information. The absence of motivation for studies and aspiration for self-development, the fear of creative tasks is also typical of this critical thinking level. The acquired information is perceived directly without any analyzing, in other words, accepted on authority.

*Medium critical thinking level* involves those mental abilities and skills that are sufficient for estimating and analyzing basic or very simple statements. This level comprises little experience of giving for-and-against arguments, low abilities for analyzing and self-reflection. Nevertheless, possessing medium critical thinking level means accepting critical analysis as an integral part of any intellectual process. Cadets make an attempt to estimate the acquired information and conduct a many-sided analysis.

*High critical thinking level (level above the average)* implicates well-developed skills of most intellectual operations, e.g. an ability to recognize one's flaws (including one's behavior, speech, performance, etc.), to find the mistakes faster than others, give reasons for the point of view and self-assessment, provide logically relevant pros and cons, demonstrate tolerance towards evidence-based criticism. The high level of critical thinking is also characterized by integrative mental competences based on the combination of logical, problem-oriented and critical thinking and the ability to apply these competences in practical, professional and social spheres.

It is obvious that assessment of students' initial level of critical thinking is the first thing to be done when using the technology of developing critical thinking at foreign language lessons. In modern science there are plenty of methods to assess this competence. In the present paper method "Critical analysis" by J. Barrett [2] and method "Finding the logical mistake" by Michael Cheifetz [3] were used. 60 first-year cadets took part in the research. The analysis and calculation of the results showed that most cadets (48% and 43% respectively) have low and medium critical thinking level; as few as 9% of the cadets have higher level of critical thinking.

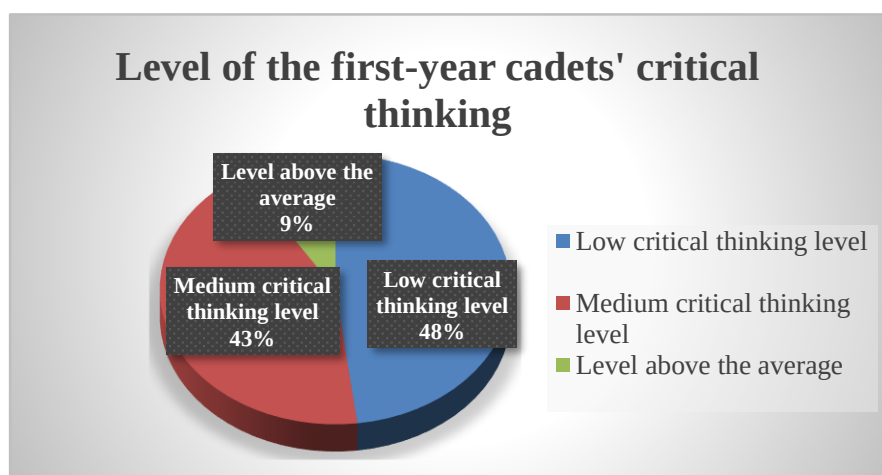


**Diagram 1.** The results of the diagnostic

Therefore, the great majority of the first-year cadets in Yaroslavl Air Defence Military College have insufficient level of critical thinking for dealing with practical professional tasks. This justifies topicality and necessity of using the technology of developing critical thinking in higher education including the course of foreign languages.

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**ПЕРСПЕКТИВЫ И РЕЗУЛЬТАТЫ ОНЛАЙН-СОТРУДНИЧЕСТВА В СФЕРЕ  
ДОПОЛНИТЕЛЬНОГО ОБРАЗОВАНИЯ С НОСИТЕЛЯМИ ГРЕЧЕСКОГО И**

**АНГЛИЙСКОГО ЯЗЫКОВ НА ПРИМЕРЕ ОПЫТА УЧЕБНО-  
КОНСУЛЬТАЦИОННОЙ ПЛАТФОРМЫ МОГУ  
PROSPECTS AND RESULTS OF ONLINE COOPERATION IN THE FIELD OF  
ADDITIONAL EDUCATION WITH NATIVE SPEAKERS OF GREEK AND ENGLISH AS  
EXEMPLIFIED BY THE EXPERIENCE OF THE TRAINING AND CONSULTING  
PLATFORM MOGU**

**Аннотация.** В современном мире остро стоит вопрос компьютеризации образования, из-за чего эффективным методом изучения иностранных языков стали прямые онлайн-мосты с носителями языка. В пандемию коронавируса онлайн-образование вышло на новый уровень, что необходимо учитывать при формировании стратегии и плана изучения иностранного языка. Изучение с носителем – это высокоэффективный способ изучения иностранного языка, что подтверждено научными исследованиями и результатами учеников платформы «МоГУ». В работе описан конкретный опыт применения методики на учебно-консультационной платформе «МоГУ» в рамках культурного сотрудничества с Грецией, подробно расписаны система внедрения и результаты применения такой образовательной технологии для обучения дошкольников и школьников, изложены перспективы развития этого направления на платформе, в городе и стране в целом.

**Abstract.** In modern world, the issue of computerization of education is acute, which has made direct online bridges with native speakers an effective method of learning foreign languages. In the coronavirus pandemic, online education has reached a new level, which should be taken into account when forming a strategy and plan for learning a foreign language. Learning with a native speaker is a highly effective way to learn a foreign language, which is confirmed by scientific research and the results of the students of the “MoGU” platform. The paper describes the specific experience of applying the methodology on the educational and advisory platform “MoGU” within the framework of cultural cooperation with Greece, describes in detail the system of implementation and the results of such educational technology for teaching pre-school and schoolchildren, outlines the prospects of this direction on the platform, in the city and the country as a whole.

**Ключевые слова:** онлайн, носители, иностранный язык, опыт, эффективность.

**Key words:** online, native speakers, foreign language, experience, efficiency.

In modern pedagogy the issue of increasing the effectiveness of foreign language learning through live (face-to-face) or online communication directly with native speakers is widely discussed [1; 2; 5]. From the experience and research on the methodology of teaching foreign languages the most effective method is traditionally considered to be full immersion in a language environment, in which the learner directly in practice learns the four key aspects of the language: speaking (speaking), reading, writing, listening. Unfortunately, this opportunity is closed to many for a number of reasons:

- The coronavirus pandemic and the world lockdown that disrupted the usual conditions of life, including those affecting tourism and cultural exchange.

- The family's financial situation. According to the site vlagere.ru, which specializes in sending children and teenagers in language camps abroad, a two-week stay in a language camp in the UK will cost from 195–250 thousand rubles, depending on living conditions, location and level of the host college or camp, the transfer. If we add to this sum getting visas and drawing up all documents, payment for transfers and fees, it becomes obvious that most CIS citizens cannot afford to spend such an amount for their child's education abroad.

- Age. Many educational programs have an age limit, so that young children (up to 8–10 years old) or older people (50–55+) cannot afford to study



– Health peculiarities or chronic diseases that can't endure a flight or that are a contraindication for staying at the camp (asthma, diabetes, cancer, etc.).

Studying foreign languages with the help of direct online bridges with native speakers has become the best solution to maintain the level of language practice in the age of pandemic. The training and consulting platform “MoGU” was the first in the city of Sevastopol to introduce such methods in the study of English, German, French and Greek for children of preschool and school age, students and adults. Thus, the purpose of this work is to highlight the possibility and the results of the introduction of online classes with native speakers of foreign languages, the use of such techniques in the modern educational process, as well as highlight the results of such training.

In classes, students work on topics that correspond to their level of language proficiency with the help of the system of “flipped classroom”. This methodology allows the student to prepare for going live with a native speaker once or twice a month by practicing homework exercises and face-to-face classes with the teacher. Thus, the student already knows the words and all the necessary grammatical constructions, which allows them to communicate with a native speaker on a given topic. In addition, online practice allows the student to break the psychological barrier of speaking in a foreign language, removing the confusion of live interaction with a foreigner and the fear of making a mistake. Such a system is widely used abroad, at universities and in distance classes, according to researchers, is an effective way to learn new material [3; 4].

In our practice this format of cooperation turned out to be optimal, as students have an opportunity to assess their progress in learning a foreign language and get a live experience of communication with a native speaker, learn more about the culture and history of the country of the studied language. They get additional motivation, which allows them to achieve success in learning faster. According to the results of the feedback collected from parents and students in the summer of 2021, about 95% of schoolchildren have a “perfect” grade in the foreign language studied with a native speaker, which proves the high effectiveness of this methodology after the first month of study. Parents also note the high interest of children in the lessons, as many of them are conducted in the form of a game with the use of modern tools, sites and applications (Quizlet, Kahoot, etc.). Homework assignments are often also given in a creative form (for example, the child is offered to record a video on the topic studied, compose a quiz, or write a story).

Thus, in addition to developing his or her communication skills, the student learns to think outside the box, offer creative ideas, and put them into practice. Another undoubted advantage of learning with a native speaker is learning a lively colloquial vocabulary, modern slang used abroad. It gives a person a chance to be fully immersed in a foreign speech and to understand modern trends in language development, modern pieces of culture (for example, teenagers, thanks to the study of colloquialisms can watch their favorite TV series in their native language, which gives a possibility to combine work and pleasure – a child becomes fond of language and wants to practice it independently).

Besides, our partners are happy to tell their students about life, share their advice and tell about the local customs and habits, which allows you to “feel” the atmosphere of the state. This also establishes intercultural exchange and introduces the children to different cultures, helps them to look adequately at the conditions of life in their own country and abroad. In this way, the learning process broadens students' horizons and fosters a sense of national pride.

What is the effectiveness of learning Greek and English exactly on the educational-advisory platform “MoGU”?

– Our teachers are highly qualified specialists, associate professors and teachers of Lomonosov Moscow State University. Their knowledge is confirmed by international certificates from Cambridge University and extensive experience in overseas practice

– We have representatives abroad, through whom we coordinate the work of the office and native speakers.

– The platform provides active preparation for children and adults to pass international exams by the University of Cambridge, Michigan University

– We provide advice on applying to leading universities in Greece and Germany, as our specialists are certified educators in these countries and know the intricacies of applying. We provide assistance at all stages of the application process and help you to pass the exam in the embassy.

– Our English and Greek teacher is a member of the Hellenic American Union, a language testing center in Greece. This allows her to develop and improve her own methods of preparation for the language exams at any level.

There are great prospects of cooperation with Greece: a country with a rich culture, EU member and quite loyal to foreigners. Work with direct online bridges on the platform “MoGU” has been conducted for about a year, and during this time we have achieved significant results. Firstly, students have increased their level of language proficiency at least by one level (according to the European classification (CEFR) and are preparing to pass the exams for the language level in English. In addition, motivation has increased, because children can see the result of their efforts directly in practice, they can watch movies and cartoons in the original language, and talk with a foreigner. To summarize, online lessons allow children to “plunge” in the atmosphere of the studied language, which allows them to memorize grammar and vocabulary structures faster during regular classes. Also the students gained confidence in their speaking level, as a student said: with the help of online lessons he broke the language barrier and now can easily communicate with his relatives in Germany in their native language. Secondly, this methodology is new for the sphere of additional education in Sevastopol, which made it possible to apply for the all-Russian award to support NKO, volunteers, journalists and small businesses “WeVmeste” and get into the semifinals. It is a very valuable achievement for us, but we believe that in the future this platform-based methodology will only be developed and improved. For example, we have the prospect of full-fledged cooperation with France and China, the development of our own online platform for learning foreign languages and practicing topics through well-chosen exercises.

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**РОЛЬ АНГЛИЙСКОГО ЯЗЫКА В РАЗВИТИИ ДЕТЕЙ  
ДОШКОЛЬНОГО ВОЗРАСТА  
THE ROLE OF ENGLISH IN THE DEVELOPMENT OF  
PRESCHOOL CHILDREN**

**Аннотация.** В статье представлен анализ оценки влияния раннего изучения английского языка на развитие личности ребенка. Рассмотрены различные теоретические и практические исследования зарубежных и отечественных ученых, раскрывающие сущность вопроса и его решения, как с негативной, так и с положительной стороны. Отмечен явный перевес в пользу благоприятной оценки влияния раннего изучения английского языка, однако, при соблюдении определенных условий. Раннее изучение английского языка при использовании правильного подхода способствует не только культурному и языковому развитию ребенка дошкольного возраста, но и оказывает благоприятное влияние на психическое развитие личности ребенка в целом. Этот эффект достигается благодаря некоторым особенностям развития детей дошкольного возраста, о которых писали ученые в своих исследованиях.

**Abstract.** The article presents an analysis of the assessment of the impact of early learning of the English language on the development of a child's personality. Various theoretical and practical studies of foreign and domestic scientists are considered, revealing the essence of the issue and its solution, both from a negative and a positive side. There is a clear preponderance in favor of a favorable assessment of the impact of early learning of the English language, however, subject to certain conditions. Early learning of English with the right approach contributes not only to the cultural and linguistic development of a preschool child, but also has a beneficial effect on the mental development of the child's personality as a whole. This effect is achieved due to some features of the development of preschool children, which scientists have written about in their research.

**Ключевые слова:** дошкольный возраст, критический период, билингвизм, усвоение языка, раннее развитие.

**Key words:** preschool age, critical period, bilingualism, language acquisition, early development.

The knowledge of English is necessary in the modern world. The relevance of the research topic lies in the insufficient degree of knowledge of the role of the English language in the development of the child. It is important to identify the advantages and disadvantages of early learning of foreign languages with the help of analysis and theoretical justification of psychological scientists. Early learning of English is understood as an intuitive and practical approach in the period from the birth of a child to school education [1].

There are opinions that it is impossible to overload a preschooler with learning a foreign language. In 1890, one of the professors of the University of Cambridge expressed the opinion that the study of a second language reduces the spiritual and intellectual growth of a person. The author of the book *Foundations of Bilingual Education and Bilingualism* (1993), Colin Baker, notes that the negative impact of bilingualism included a variety of consequences from mixing languages in a person's head and a split personality to spiritual poverty. It was believed that bilingual children lag behind monolingual peers in learning, have a lower IQ and adapt poorly to the social environment [2].

There was an opinion that the brain has a limited capability regarding the perception of more than one language. The proponents of this theory believed that the better a person knows one language, the less he can learn from another. The followers of such theories concluded that learning two languages leads to poor language proficiency and confusion in a person's head [3].

In 1915 I. Epstein, a representative of the school of associative psychology, turned to the study of the influence of bilingualism on the intellectual development of a child. In his opinion, thinking is an association between ideas and education [1].

Even K. Ushinsky wrote: "In a few months, a child learns to speak a foreign language in a way that he cannot learn in a few years" [5].

The Chomsky school also postulates the innateness of language ability. The absence of a language barrier among preschoolers is noted. Numerous studies have proved that with the right approach to language learning, communication skills are formed, which increases the level of cultural and social development [4].

Preschoolers have a high plasticity of brain and mental functions, which contributes to great potential development opportunities; however, their implementation depends on an organized approach.

Information that a child learns a foreign language is more easily than an adult and available both in domestic (L.S. Vygotsky, S.I. Rubinstein) and in foreign psychology (Johnson and Newport, D. Singleton, B. White, J. Bruner, W. Penfield, R. Roberts, T. Eliot). The child's brain has a specialized ability to learn a foreign language, but it decreases with age. L.S. Vygotsky, D.I. Pisarev, L.V. Shcherba and N.K. Krupskaya believed that learning a foreign language contributes to the development of the native language, the development of mental processes (attention thinking, memory, imagination). This is confirmed by the experiments of the laboratory of teaching foreign languages of the Research Institute of General and Secondary Education of the Russian Federation. It was also noted the positive impact of learning English on the mental development of the child [6]. Thus, as a result of an experiment conducted in schools in England and Wales, involving 6,000 children, it was found that foreign language classes have a positive effect on native knowledge. Studies by leading universities in the USA and Canada have shown that bilingual children develop cognitive abilities better than monolinguals [6].

At the Philadelphia Institute, a doctor Glenn Doman proved that effective learning occurs during the period of brain growth. It is based on the action of such functions as thinking, will, memory. The child has a positive educational motivation. Many authors say that learning a foreign language not only contributes to the versatile development and upbringing of a preschooler, but also creates favorable conditions for the development of both linguistic and general abilities [6].

The speed and strength of memorizing foreign language material at this age is explained both by the predominance of long-term memory mechanisms and by the presence of the phenomenon of "imprinting", imprinting language material into consciousness, provided there is the necessary motivation, incentive. Psychologists determine the time possible for imprinting, up to 8 years. This age also has some limitations that opponents of early learning like to refer to, for example, a child's

memory capacity is really less than an adult's, but his language needs are also less, and, in addition, there is every reason to believe that it is language classes that contribute to a gradual increase in memory.

E.A. Arkin identifies the age of five as the most suitable (both physiologically and psychologically) when internal speech is formed, the ability to role-play to start any educational activity. At this age, the ability to purposeful activity appears, he acquires a sufficient lexical stock. It is best to study a foreign language at 5–8 years old, when the system of the native language has already been mastered well enough by the child, and he treats the new language consciously [10]. The existing experience of domestic and foreign research in this field proves that learning a foreign language, if properly organized, develops children, and raises their educational and cultural level.

Thus, preschool age is the best period to introduce a child to a foreign language. The lexical material of a group of this age is remembered easier, faster. In addition, preschoolers have an interest in communication, there is no language barrier. This age is characterized by involuntary memorization, the predominance of mechanical memory, visual-imaginative thinking. Even if there is a break in learning, the English language learned in childhood recovers quite quickly [7].

Today, learning a foreign language at preschool age is part of the cultural and linguistic development of a child's personality. Its role in the development of social and creative thinking is great. For example, Gines, Tucker and Lambert (1975) showed a different level of perception of interpersonal relationships among bilinguals and monolinguals. Bilingual children from kindergarten to second grade used more details in their speech than their monolingual peers when explaining the rules of the game to other children who were blindfolded [9].

It has been established that a preschooler learns a second language more easily than an adult, only under the condition of the joy of learning a foreign language on the basis of a humanistic approach [8]. In preschoolers, imaginative thinking prevails, so language acquisition should take place in a playful way. The mastery of thought in preschoolers occurs through the internalization of external actions.

In conclusion, we note that there are different points of view on the problem of the expediency of early learning of a foreign language. The predominance of a positive assessment of early learning of a foreign language on the development of a preschooler was revealed, subject to conditions and a special approach. Learning a foreign language, in the case of proper organization of classes, develops children, raises their educational and cultural level. Mastering the concepts of native and English language contributes to the development and formation of a child's personality, the development of creative thinking and socially adequate behavior, and the improvement of communication skills.

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**МЕТОДИКА ИСПОЛЬЗОВАНИЯ ИГР НА ОСНОВЕ ИНТЕРНЕТ-ТЕХНОЛОГИЙ  
ДЛЯ ФОРМИРОВАНИЯ ИНОЯЗЫЧНОЙ КОММУНИКАТИВНОЙ КОМПЕТЕНЦИИ  
МЛАДШИХ ШКОЛЬНИКОВ  
TECHNOLOGY OF USING GAMES BASED ON INTERNET TECHNOLOGIES FOR  
FORMATION FOREIGN LANGUAGE COMMUNICATIVE COMPETENCE OF  
YOUNGER PUPILS**

**Аннотация.** Статья раскрывает возможности интернет-технологий в контексте развития иноязычной коммуникативной компетенции обучающихся на младшей ступени обучения английскому языку. Автор статьи описывает принципы работы с виртуальным игровым материалом и анализирует дидактический потенциал интернет-технологий. В качестве результатов исследования представлены упражнения, разработанные на платформах популярных интернет-сервисов. Цель исследования – продемонстрировать функциональные возможности перспективных образовательных интернет-технологий для формирования иноязычной коммуникативной компетенции на младшем этапе обучения.

**Abstract.** The article reveals the possibilities of Internet technologies in the context of the development of foreign language communicative competence of younger pupils of teaching English. The author of the article describes the principles of working with virtual game material and analyzes the didactic potential of Internet technologies. Exercises developed on the platforms of popular Internet services are presented as the research results. The purpose of the study is to demonstrate the functionality of possibilities educational Internet technologies for the formation of foreign language communicative competence of younger pupils.

**Ключевые слова:** иностранный язык, иноязычная коммуникативная компетенция, интернет-технологии, методика обучения иностранному языку, младший этап обучения, интерактивные упражнения.

**Key words:** foreign language, foreign language communicative competence, Internet technologies, technology of teaching a foreign language, the younger pupils, interactive exercises.

Currently, there are quite a large number of scientific publications devoted to the formation of foreign language communicative competence, and it should be noted that each study presents its own learning technology.

The most promising pedagogical technology in the field of teaching foreign languages today is the Internet, which has extensive functionality to create a universal virtual environment that allows going through the time and spatial framework, providing its users with the opportunity to communicate authentic with real interlocutors on current topics. In addition, based on the psychological and physiological characteristics of primary school children, it should be noted that at this stage the most effective is interactive learning, which allows to form new knowledge, skills and abilities, involving children in the exciting world of the game. The attention of children at this age is characterized by low stability. The use of information technology helps to diversify activities and keep students' attention to a particular topic, as work on it is offered in a new form. Such training is possible with the use of training programs [6, p. 97].

Methodological competence and orientation towards successful learning depend on the fact that teachers and students have a wide range of methods by which they can organize independent learning. The main attention is paid to teaching methods and strategies that are aimed at individualization and holistic teaching of younger schoolchildren and allow them to actively interact with reality.

Internet technologies have a variety of tools: they combine the functions of a number of previously available individual media, multimedia and communication tools and not only transmit text and images, but also sound and video, and therefore is a universal medium.

The main criteria that a teacher should be guided by choosing online services in the formation of language competence are: 1) accessibility, resources should be free; 2) compatibility with various computer systems, that is, working with these online services should not require any reconfiguration of the computer system; 3) compliance of the type of interactive exercises with the stage of formation of a particular language skill; 4) taking into account the level of computer literacy of students; age characteristics of students [6, p. 98].

By teaching a foreign language, the following multimedia tools are often used:

- special training programs, such as electronic textbooks, language programs, tests, virtual laboratories;
- specialized systems, including those using a personal computer;
- highly intelligent learning systems that can be used in various academic disciplines;
- classification of various databases according to scientific directions;
- use of telecommunications (Skype and other networks through which information can be exchanged);
- virtual libraries, electronic journals.

All of the tools allow students to learn foreign language units more effectively. Multimedia of Internet technologies affects human vision and hearing, thereby increasing the volume and degree of assimilation of information [2].

In Russia, the choice of Internet providers is quite wide. Let's consider the most effective and universal Internet technologies that allow to form a foreign language communicative competence.

Through the service <https://www.storyjumper.com> students improve their reading, speaking, listening and writing skills by traveling through the pages of entertaining virtual books created by the teacher. (Figure 1) Or bring their stories to life by creating characters and scenes, thereby forming a communicative competence. On this platform, it is possible to create virtual books using an image bank, change illustrations, font, color scheme, characters, their location on pages and overlay audio, voicing favorite characters.

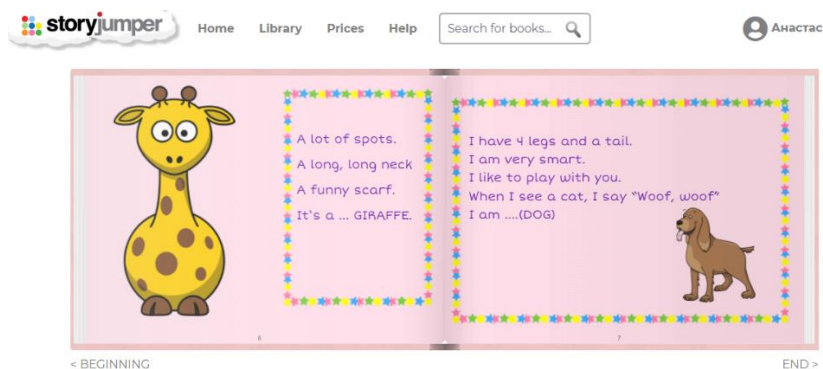


**Figure 1.**

On the platform <https://wordwall.net> it is possible to create interactive applications or print worksheets using the available templates (Figure 2). The service offers the use of the following templates: quiz, crossword, arcade games, wheel of Fortune, maze.

Students will be able to use didactic virtual games on any device online for both classroom work and self-control.

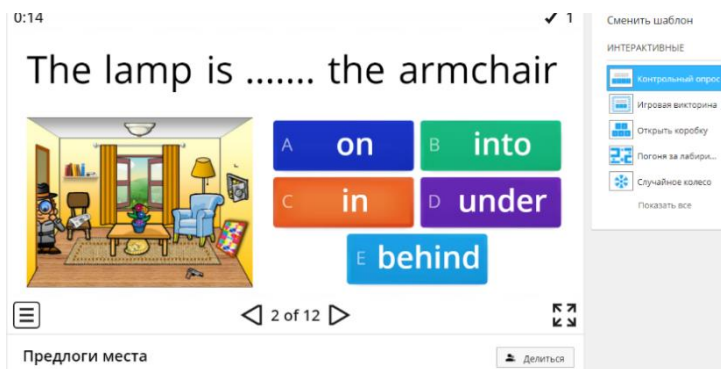


**Figure 2.**

Popular service <http://english-cards.ru> / is Russian-language service for creating and printing didactic cards in English. When creating cards, an automatic translation is used, which can be edited later, leaving the necessary words. Memorized words can be moved to the archive, and if necessary, return them back. At first, you can use ready-made cards and sets of other users, and if necessary, create your own.

One of the available Internet technologies is – <https://learningapps.org> /. This service allows you to conveniently and easily create electronic interactive exercises of the following types:

- Type 1. Find synonyms.
- Type 2. Complete word combinations.
- Type 3. Complete the text (Figure 3).
- Type 4. Guess the word.



Type 5. Match the sentences with the picture.

Type 6. Puzzle. Match verbs with the parts of puzzle.

By performing these exercises, it is possible to consolidate new material, as well as to develop the automatism of its use in similar situations. They will also help to better understand the structure of the new material being studied. In these exercises, a drawing is often used to replace a word/phrase. Such exercises form skills and form speech automatisms.



Figure 3.

Voki Service <https://www.voki.com> aims to create talking avatars. Students can choose not only people for the avatar, but also various fairy-tale characters or animals, they can change the appearance of avatars. Students voice the avatar using a microphone, phone, printed text, or by downloading an audio file, then they can save the created avatar, send it by mail, or add it to documents (Figure 4).



Figure 4.

Mastering a foreign language communicative competence is impossible without the practice of communication. The use of Internet technologies in a foreign language lesson in this context is simply irreplaceable: The virtual environment of the Internet allows you to go beyond the time and spatial framework, giving its users the opportunity to communicate authentic with real interlocutors on topics relevant to both sides. However, we must not forget that the Internet is an auxiliary technical means of learning. To achieve optimal results, it is necessary to correctly integrate its use in the course of the lesson.

So, analyzing the experience of using the presented Internet technologies in English lessons, we can say with confidence that they allow us to: provide positive motivation for learning, conduct lessons at a high aesthetic and emotional level (music, animation), provide a high degree of differentiation of learning, rationally organize the learning process, increase the effectiveness of the

lesson, improve knowledge control, form individual, creative, cognitive abilities of students. This suggests that the use of Internet technologies has a positive impact on the formation of foreign language communicative competence and modern technologies are of great importance when teaching a foreign language, in particular English.

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## **ЛИНГВОПРАГМАТИЧЕСКИЙ АНАЛИЗ ТЕКСТОВ ЖЕНСКИХ АВТОБИОГРАФИЙ** **LINGUAPRAGMATIC ANALYSIS OF WOMEN'S AUTOBIOGRAPHIES**

**Аннотация.** Настоящее исследование выполнено в рамках когнитивно-дискурсивной парадигмы и посвящено изучению англоязычных текстов женских автобиографий, в частности, выявлению их лингвопрагматических, лексических и семантических особенностей посредством применения современных методов компьютерной лингвистики. Полученные результаты указывают на стабильность женской автобиографии как жанра в области лексики и семантики при тенденции к преобладанию описания случайных событий в текстах, доминантности негативной оценки событий авторами, а также свидетельствуют о высоком потенциале методов компьютерной лингвистики для целей анализа структурно-содержательной организации текстов мемориального жанра.

**Abstract.** The paper presents a study of linguapragmatic, lexical and semantic features of 20<sup>th</sup>-21<sup>st</sup>-century autobiographies written by British and American women. A statistical analysis of ten autobiographic texts was performed, after which the obtained data were compared on the linguapragmatic, lexical and semantic levels. The research revealed that women's autobiographies have differences in linguapragmatics and similarities in the field of vocabulary and semantics. The results demonstrate that modern women's autobiographies develop new semantic and lexical features, while preserving core genre characteristics.

**Ключевые слова:** автобиография, память, темпоральность, гендер, автоматизированный контент-анализ.

**Key words:** autobiography, memory, temporality, gender, automated content-analysis.

Mnemonic texts, particularly autobiography, remain one of the topical objects of linguistic research. The interest in the phenomenon of autobiography is primarily related to its genre diversity, as well as to the high potential of using different communicative strategies [1; 2; 3; 4].

This research is conducted within the framework of the cognitive-discursive paradigm advanced in works by contemporary Russian linguists [5; 6] and devoted to the linguapragmatic, lexical and semantic specifics of English autobiographies written by women. As stated in [7; 8], the appeal to contemporary women's autobiography is associated with a constant interest in texts representing personal stories, intensified with the establishment of an anthropocentric paradigm, and with the popularization of autobiographical genres in contemporary culture, on the one hand, and with the emergence of new hybrid forms of representation of autobiographical memory and the study of cognitive processes in a gender perspective, on the other.

The objective of the paper is to test the potential of computational linguistics methods in the analysis of content and structure of contemporary English autobiographical texts, as well as to improve the research methodology of this kind of texts, taking into account modern digital technologies and the tendency to mediatization and hybridization of classic genres. The study is based on ten texts of English autobiographies written by female authors between the early 20<sup>th</sup> and early

21<sup>st</sup> centuries. The research procedures included content analysis of empirical data; identification and systematization of linguapragmatic, lexical and semantic features of autobiographies.

The study reveals the stability of women's autobiography as a genre in the field of lexis and semantics, with a tendency for the description of casual events to prevail in the texts, dominating negative evaluation of events by authors. Family and childhood themes remain dominant, as well as themes implying a description of social/political activities. However, in some autobiographies the theme of childhood was not predominant, which is non-conventional for the autobiographical genre. The results demonstrate a high potential of computational linguistics methodology for the analysis of textual organization of mnemonic narratives. The method of automatic extraction of keywords and compilation of frequency ranking lists allows determining dominant topics of texts and the degree of authors' interest in a particular field. On the basis of the data yielded by automated morphological analysis it is possible to arrive at conclusions regarding the temporality structure of the text, identify key temporal markers, determine the boundaries of the break and restoration of the spatio-temporal continuum of the text.

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## **ДЕПРЕССИЯ В ЛИТЕРАТУРЕ YOUNG ADULT DEPRESSION IN THE YOUNG ADULT LITERATURE**

**Аннотация.** Литература для молодых взрослых, или же Young adult, это категория художественной литературы, нацеленная на возрастную категорию от 12 до 18 лет. Хотя подростки и считаются основной аудиторией, данные книги популярны также и среди взрослых людей. Такие темы, как дружба, первая любовь, отношения между людьми, семья, образование рассматриваются в литературе Young adult. Данный раздел книг был создан для того, чтобы «смягчить» переход от книг, нацеленных на детскую аудиторию от тех, что рассчитаны на взрослую. В работе объяснено, почему литература жанра Young Adult, в которой часто раскрывается такое явление, как депрессия, является популярной в настоящее время. В работе указывается важность данных книг, почему с этим жанром стоит ознакомиться людям всех возрастов. Также, приведены примеры пяти книг, которые описывают депрессию.

**Abstract.** Young Adult Literature is a category of fiction aimed at the age group from 12 to 18 years. Although teenagers are considered the main audience, these books are also popular among adults. Topics such as friendship, first love, relationships between people, family, education are considered in the literature of Young adult. This section of books was created in order to “soften” the transition from books aimed at a children's audience from those designed for adults. The paper explains why the literature of the Young Adult genre, in which such a phenomenon as depression is often revealed, is currently popular. The paper indicates the importance of these books, why people of all ages should familiarize themselves with this genre. Also, there are examples of five books that describe depression.

**Ключевые слова:** литература, Young Adult, депрессия, проблемы, психическое здоровье, литература взросления.

**Key words:** literature, Young Adult, depression, issues, mental health, literature of growing up.

Young Adult Literature is a genre that is separate from Children's Literature. It emerged in the twentieth century when teenagers became a powerful force of the economy in the 1930s and gained prominence in the sixties. Mental health issues comprise a big part of themes about which books of this genre are. Depression is one of them. This fact is one of the reasons why Young Adult books are popular. Readers can find themselves in the books' characters because they have experienced or are experiencing mental illness in their lives or have seen similar problems in a loved one's life. It is statistically proven that depression is common among young people.

Depression is a serious medical illness when a person experiences such symptoms as feeling very sad; loss of interest in favorite activities; not being able to sleep, or sleeping too much; feeling hopeless, irritable, anxious, or guilty; feeling very tired; aches or pains, headaches, cramps, or

digestive problems; thoughts of death or suicide. There are factors which seem to lead to trigger and develop depression in a person, such as traumatic or stressful events, relatives with a history of depression, history of other mental health disorders, abuse of alcohol or drugs, serious or chronic illness, etc.

Depression can be difficult subjects to approach, but fortunately, many young adults' novels deal with this topic. Books may provide an excellent way to reach out to teenagers and young people struggling with depression or dealing with it in their family or friends. Young adult books tend to deal with the topic in caring, responsible ways hence people who are not aware of such mental condition will understand the problem and might help their relative or friend.

In this article we give examples of Young Adult books containing the topic of depression and study factors that caused the mental disease.

1. "Our Chemical Hearts" by Krystal Sutherland [7]. The main female character of the novel has gained depression after a car accident. She was badly injured and lost the person she loved. A reader sees how she tries to cope with her problems and whether her ways are beneficial or not.

2. "Speak" by Laurie Halse Anderson [2]. This book is about a young girl who is friendless at school due to a very stressful event in her life. Spending a lot of time alone and without finding the strength to talk about her problems she practically stops speaking at all. The girl shows to a reader how it is important to speak up for oneself.

3. "When We Collided" by Emery Lord [5]. The main character's mother suffers from depression that was caused by her husband's death. Reading this book, we see how her depression affects her children's lives.

4. "Wintergirls" by Laurie Halse Anderson [1]. It is a very emotional and powerful story about a teenage girl suffering from depression that is a result of another mental health disorder: eating disorder and also the loss of her best friend. The author wrote the book to address how many teens suffer from depression, eating disorders and feeling lost.

5. "13 Reasons Why" by Jay Asher [3]. This story is about a young high school student who descends into despair brought on by betrayal and bullying, culminating with her suicide. In her 13 records she explains why she has decided to commit suicide.

Talking about mental health does not come easily. It is a topic that has been stigmatized for a long time now. Some people even turn a blind eye to it. But mental health is as important as physical health. And one of the most common issues affecting young people in particular is depression. That is why it is vital that this topic can be frequently met in the Young adult literature. People are learning more about depression through these books.

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**ИНТЕРАКТИВНЫЕ ТЕХНОЛОГИИ КАК СПОСОБ ОБУЧЕНИЯ  
ГОВОРЕНИЮ НА УРОКАХ АНГЛИЙСКОГО ЯЗЫКА В СТАРШИХ КЛАССАХ  
INTERACTIVE TECHNOLOGIES AS A WAY OF TEACHING SPEAKING IN  
ENGLISH CLASSES IN SECONDARY SCHOOL**

**Аннотация.** Данная статья посвящена рассмотрению актуальности и особенностей применения интерактивных технологий в процессе обучения говорению на английском языке в старших классах. Целью статьи является научно-обоснованная разработка практических заданий с применением интерактивных технологий по английскому языку, направленных на совершенствование умений диалогической и монологической речи у обучающихся на старшей ступени обучения. В процессе работы нами были проанализированы учебно-методические комплексы по английскому языку, а также лингвистическая, педагогическая и методическая литература по теме исследования; были определены понятия «говорение» и «интерактивное обучение»; были описаны конкретные интерактивные методы обучения. В соответствии с данными методами и учебно-методическими комплексами были разработаны интерактивные задания. Разработанные задания могут быть использованы учителями общеобразовательных школ для совершенствования у старшеклассников умений диалогической и монологической речи на уроках английского языка.

**Abstract.** This article is devoted to the relevance and features of the use of interactive technologies in the process of teaching speaking in English classes in secondary school. The purpose of the article is the scientifically grounded development of practical tasks with the use of interactive technologies in English, aimed at improving the skills of dialogical and monological speech of students at the senior level of education. In the course of our work, we analyzed educational and methodological complexes in the English language, as well as linguistic, pedagogical and methodological literature on the research topic; we defined the concepts of “speaking” and

“interactive education”; we described specific interactive teaching methods. Interactive tasks were developed in accordance with these methods and educational and methodical complexes. The developed tasks can be used by teachers of secondary schools to improve the skills of dialogical and monological speech in English lessons for secondary school students.

**Ключевые слова:** интерактивное обучение, иноязычная коммуникативная компетенция, английский язык, говорение, старшие классы.

**Key words:** interactive teaching methods, communicative foreign language competence, the English language, speaking, secondary school.

Modern tendencies in school education determine the change of approaches in the organization of the educational process. This change is due to the dynamics of social development, the development of new learning technologies and the needs of the individual. Interactive methods are replacing traditional teaching methods. In addition, in the process of teaching foreign languages, more attention has been paid to such a type of speech activity as speaking.

The relevance of this study lies in the fact that when learning to speak a foreign language, the interaction between students is important, which can be provided with the help of interactive technologies.

According to Nadezhda I. Gez and Natalya D. Galskova, speaking is a form of “oral communication, through which information is shared, contact and mutual understanding are installed, it is the impact on the interlocutor in accordance with the communicative intention of the speaker” [4, p. 39].

D. Nunan emphasizes that “speaking involves not only knowledge of the elements of the language, its grammar, vocabulary, phonetics (linguistic competence), but also awareness of when, why and how to use this language (sociolinguistic competence) [7, p. 40].

The use of interactive technologies in English classes helps to create a language environment where language performs its direct function – as a means of forming and formulating thoughts. So, what exactly is interactive education?

Tatyana S. Panina understands interactive education as “a way of cognition carried out in the forms of joint activity of students: all participants in the educational process interact with each other, exchange information, jointly solve problems, model situations, evaluate each other's actions and their own behavior, immerse themselves in the real atmosphere of business cooperation to solve problems” [5, p. 120].

There are many different interactive methods that can have a positive impact on the process of learning English, speaking in particular. We propose to consider some of them.

“Beach Ball Bingo” is an interactive technique in which a ball is used. On all surfaces of the ball, the teacher writes or sticks questions. Students throw this ball to each other in turn. When a student catches a ball, he answers one of the questions that his fingers point to [8, p. 102].

The following tasks were developed by us on the basis of the “Beach Ball Bingo” method and the information provided in the textbook “Enjoy English” on page 106. This task is dedicated to the topic “Progress and development”.

Before carrying out this task, students read the text on the topic “Progress and development” to familiarize themselves with the relevant information. After the students read the text, they will need to stand in a circle. The teacher throws a ball on which the questions are glued. They sound like this:

*How is your life dependent on technology?*

*Do you think people depend on computers too much?*

*What do you think the world would be like without computers?*

At the command of the teacher, the students begin to throw the ball to each other. To whom the ball fell into the hands, he answers the question to which his fingers point.



The “Beach Ball Bingo” method is aimed at improving students’ monological speech skills. This method allows you to develop the ability to express your thoughts with sufficient completeness and accuracy in accordance with the tasks and conditions of communication.

The “Traffic Light” method is one of the effective interactive methods that can be used in teaching speaking. At the first stage of the work, the teacher gives 3 types of cards to students: green, yellow and red. Then he asks the students a specific question or statement with which the students can agree, disagree or abstain. Those who disagree with this statement should raise a red card. Students to whom this statement seems to be true, raise a green card, and those who find it difficult to make a decision – a yellow one. Next comes the distribution into groups, based on who picked up which card. The students have a task: to discuss their opinion on the question or statement of the question in groups and to give arguments for or against. At the final stage, after the discussion, each team expresses its opinion on the question posed, arguing it. Participants of other student teams can ask questions to speakers [6, p. 94].

Using the material of the textbook “Spotlight” presented on pages 122–123, we have developed tasks based on this interactive method.

At the first stage, the teacher gives 3 types of cards to students: green, yellow and red. Then he asks the students the following question: “Is it true that computer technology, television and smartphones have made teenagers antisocial these days?” Those who disagree with this statement should raise a red card. Students to whom this statement seems to be true, raise a green card, and those who find it difficult to make a decision – a yellow one.

At the second stage, the teacher distributes students into groups based on who picked up which card: the red ones are in one group, the green ones are in the second, and the yellow ones are in the third. The students have a task: to discuss their opinion on the question “Is it true that computer technology, television and smartphones have made teenagers antisocial these days?” in groups and give arguments for or against.

At the third stage, after the discussion, each team expresses its opinion on the question posed, arguing it. Students from other groups can ask questions to the speakers.

The advantage of the “Traffic Light” method is that it helps in developing the ability to defend one’s point of view using arguments, and also educates a tolerant attitude to the opinions of other people.

Another method worth paying attention to is “Pinwheel Discussions”. When using this method, students are also divided into groups. To all groups, except one, the teacher provides certain topics or positions on any issue. The group that was not given a topic is designated as a group of “provocateurs”. Each group chooses a speaker, after which all the speakers sit facing each other, and the other members of the groups sit in a fan behind them. This method has such a name because the view of the students’ positions from above resembles a pinwheel. Speakers discuss their assigned positions (or provoke further discussion if a speaker from a group of “provocateurs” speaks), and every few minutes the speakers replace each other and continue the discussion [8, p. 99].

To demonstrate how to implement this method in the process of learning to speak English, we chose the topic presented on page 95 in the textbook “Spotlight” for grade 10 “The River Thames”. The purpose of this task is the development of socio-cultural competence among students.

At the first stage, students are divided into 4 groups by drawing lots. The teacher distributes the following subtopics between 3 groups, which designate the sights of London on the River Thames: The London Eye, The Tower of London, The London Dungeon. The fourth group acts as “provocateurs” who will ask questions to the speakers. To get acquainted with information about their attractions, the teacher provides groups with special memos. The fourth group is given sample questions:

- 1) *When and by whom was this landmark built?*
- 2) *What does this attraction look like?*
- 3) *Does this attraction have a specific function?*
- 4) *What impression does it make on you?*
- 5) *Would you like to visit it? Why? Why not?*

At the second stage, after reading the material, each group chooses a speaker. All speakers sit facing each other, and other participants sit in a fan behind them. Speakers begin to discuss their topics with the help of leading questions from a group of “provocateurs”. Every few minutes, the speakers replace each other and continue the discussion.

At the third stage, the assimilation of knowledge by all participants of the discussion is checked.

*Exercise 1. Answer the questions:*

- 1) *What were the purposes of the Tower of London?*
- 2) *Which London landmark is the symbol of the millennium?*
- 3) *What attraction is associated with the Great Fire of London?*
- 4) *What is the purpose of the London Eye?*
- 5) *Why do you think the London Dungeon has become a tourist destination?*

*Exercise 2. Make up and act out a dialog on one of the topic “Take a trip along the Thames”. You can choose one or all of the three attractions to discuss. Imagine that you are two friends / a tourist and a resident of London / a guide and a tourist.*

As a homework assignment, students are also invited to create a brochure on one of the studied attractions located along the Thames. The work is carried out in the same groups that were organized in the lesson, but they change topics. For example, those who had the theme “The Tower of London” are now preparing a brochure for tourists on the theme “The London Eye”, etc. In the next lesson, each team presents its brochure in front of the class.

*Exercise 3. Design an information leaflet for tourists about on the London attractions (The London Eye / The Tower of London / The London Dungeon). Don't forget to use pictures.*

At the final stage of working with this topic, students evaluate each other's work, marks are set.

In conclusion, it is worth noting that interactive teaching methods used in English lessons help to increase students' interest in the topic being studied. The learning process becomes richer and more exciting both for students and for the teacher himself. All the methods and techniques of interactive learning that the teacher uses contribute to the development of independence, creative and critical thinking, develop students' communication skills, and also contribute to improving teamwork skills. The interactive form of various techniques, the authenticity of the materials selected for them, as well as the problematic nature of the task increase the motivation of students to master the English language, form communicative competence, develop the skills of both monological and dialogical speech, as well as train the thinking abilities of students.

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## **ОСОБЕННОСТИ ДИСТАНЦИОННОГО ОБУЧЕНИЯ ИНОСТРАННОМУ ЯЗЫКУ СТУДЕНТОВ ЮРИДИЧЕСКОГО ПРОФИЛЯ В УСЛОВИЯХ ПАНДЕМИИ FEATURES OF DISTANCE LEARNING FOREIGN LANGUAGE STUDENTS OF THE LEGAL PROFILE IN THE CONDITIONS OF THE PANDEMIC**

**Аннотация.** Статья посвящена особенностям дистанционного обучения иностранному языку в условиях возникшей новой коронавирусной инфекции. Рассматриваются изменения структуры обучения и организации учебного процесса, а также анализируются итоги использования дистанционных технологий в период с 2020 по 2021 годы. Автором производится сравнительный анализ факторов положительного и негативного влияния, повлиявших на общеобразовательный процесс по дисциплине иностранный язык, относительно этапов предшествующих самоизоляции студентов, и дальнейший переход на дистанционный формат в процессе обучения в экстремальных условиях самоизоляции. Исследование основывается на доктринальных исследованиях в области российского перехода на дистанционное обучение, как общемировую форму, закрепившую за собой лидирующие позиции в перспективе как образование «будущего», а также на основе уже

имеющегося опыта обучения в условиях вынужденно-экстренного перехода на дистанционный режим обучения.

Автор статьи выделяет ряд положительных факторов обучения студентов в дистанционном формате, а также рассматривает новые проблемы дистанционного обучения. Анализ недостатков дистанционного обучения иностранному языку в вузе демонстрирует острую необходимость заполнения данного пробела в методике обучения, общей системе образования и практике преподавания, что, в свою очередь, обуславливает необходимость искать новые пути решения возникших проблем с целью дальнейшей адаптации образовательного процесса к возможным экстренным ситуациям в будущем.

**Abstract.** The article addresses the peculiarities of distance learning of a foreign language in the context of a new coronavirus infection. Changes in the structure of training and organization of the educational process are considered, and the results of the use of distance technologies in the period from 2020 to 2021 are analyzed. The author makes a comparative analysis of the factors of positive and negative influence that have an effect on the general educational process in the discipline of a foreign language, relative to the stages preceding the self-isolation of students, and the further transition to a distance form in the learning process in extreme conditions of self-isolation. The study is based on doctrinal research in the field of the Russian transition to distance learning as a global form that has consolidated its leading positions in perspective as education of the “future”, as well as on the basis of the existing learning experience in the context of a forced-emergency situations to distance learning.

The author of the article reveals a number of positive factors of teaching students in a distance learning form, and also considers new problems of it. The analysis of the shortcomings of distance studying a foreign language at the University demonstrates the urgent need to fill the gap in teaching methods, the general education system and teaching practice, which, in its turn, makes it necessary to look for new ways to solve the problems that have arisen in order to further adapt the educational process to possible emergency situations in the future.

**Ключевые слова:** иностранный язык, дистанционное обучение, обучение в период самоизоляции, недостатки дистанционного обучения, преподавательская деятельность в дистанционном формате.

**Key words:** foreign language, distance learning, learning during self-isolation, disadvantages of distance learning, teaching in a distance form

In the circumstances of the new coronavirus infection COVID-2019, the issue of distance learning is becoming increasingly important, since the forced-emergency transition has become a real challenge for many higher educational institutions in Russia. In the emerging extreme situation, significant shortcomings of online teaching have been identified, both from the organizational and technical side, and taking into account personal characteristics. New conditions have made it possible to immerse oneself in an experimental methodology, where the experience of analyzing teaching foreign languages let it comprehend the disadvantages of distance learning, and as a result, an urgent need to find the optimal forms of organizing the educational process has been determined.

The changed form of education has largely influenced the specifics of teaching, the education system and the educational process itself. The specifics of teaching a foreign language mainly depends on the development of language and communicative competencies by students, which, in turn, is complicated by the transition to a distance form.

The passage to distance learning has showed that no one has been certainly ready to organize the educational process in such conditions due to the fact that educational institutions have never used the distance form as the main system for teaching students, and have never conducted their educational activities in a pandemic. In emergency conditions, teachers have had to adapt to the new

realities of the forms of the educational process, along the way improving their qualifications, learning information technology, allowing to provide a “high degree of interaction” between the teacher and students [3, p. 20]. L.M. Babakova considers that, in the context of distance education, “a tutor ceases to be just a teacher,” he becomes a teacher-engineer, constantly mastering and studying innovations in the field of computer technology and communications” [2, p. 72].

The purpose of this article is to analyze the shortcomings of distance learning in the University of a foreign language in the conditions of self-isolation of students, which does not allow classroom practice of teaching a discipline in a traditional way and the subsequent absence of offline interaction between the teacher and students. This goal is realized through the method of analytical research of the experience and methods of teaching a foreign language for the previous academic year. The methods of research have been the detailing and interpretation of positive and negative aspects in comparison of the traditional, customary form of education with the remote form that urgently has come to replace it in conditions of forced self-isolation. When studying the positive and negative aspects, we have been guided by the experience of teaching a foreign language in humanitarian specialties, in particular, in a non-linguistic university.

Considering the general specifics of distance learning during the period of self-isolation, it is important to note that it makes no sense to talk about the effectiveness of this learning form as a whole, since in an emergency situation it has been about maintaining the usual rhythm of organizing educational activities. According to A.A. Kiselev, practice demanded that universities continue to educate students under quarantine conditions. Universities have had to “immediately transfer all contact training sessions (lectures, practical and laboratory classes) to the online environment” [4, p. 96] with full or partial saving of the schedule. At this stage, specialists are examining the main indicators of the successful implementation of distance learning, not bypassing the risks and putting forward subsequent methods of eliminating them, since “now it is possible, based on the experience already gained, to see what and how in the field of distance learning needs to be done in universities so that of necessity it gave the required result” [6, p. 98].

As E.A. Salimgireev supposes, “universities will be” forced “to develop and create online courses”. We also add that now universities have to look for the best ways to organize foreign language classes in local and global Internet networks.

Nevertheless, it should be understood that the process of studying a foreign language in a traditional form in a non-linguistic university has its own characteristics in comparison with other disciplines that are not burdened with such a rigid practice-oriented approach to language learning. For a foreign language, researchers note fundamental differences in the form of material presentation, ways of interaction between a teacher and a student, and talk about the related problems of a methodological and methodological nature [9, p. 145–146].

Synchronous interaction is necessary, since the process of teaching any subject is understandable not as an individual activity of students with educational material, with a subject of instruction, but as a specially organized communication at each stage of the lesson. O.V. Lvova rightly notes that distance learning of foreign languages has its own specifics, due to the fact that it involves teaching various types of speech activity. Naturally, “for teaching reading and writing, you can largely limit yourself to a network course”, since the features of these types of speech activities do not require by themselves three-dimensional graphics and even a significant volume of soundtrack. Nevertheless, when teaching pronunciation, speech and listening, it is not possible to limit ourselves only to text files; sound accompaniment is necessary, as well as the creation of various situations that stimulate the oral statements of the trainees. For a foreign language, systematic contact classes are also necessary because “the effectiveness of the delayed working out of difficulties is lower” [9, p. 146].

The full-time form, in particular, in the direction of the legal specialty, is based on a layer of official vocabulary of a special orientation and terminology, as well as features of grammatical structures. In order to master this most important educational material in a foreign language, special training methods are developed, aimed at modeling situations close to the reality of professional

activity. Thus, there is a consolidation of motivational exercises by “playing” certain professional situations in the environment of a live audience using dialogue speech.

At the Russian State University of Justice, the studying of a foreign language is supported in the most synchronous form – in online conferences with visual contact, work in a virtual classroom on a schedule, where students interacted with the teacher in real time while studying a foreign language. In general, training has not become part-time or distance learning, the schedule has been preserved, and the time for individual virtual contacts with each of the students has increased.

Learning a foreign language through distance technology is a constantly updated process on the part of technical progress. In this aspect, the form of the traditional, customary concept of teaching students of the foreign languages is undergoing significant changes. [5, p. 76].

The goal of teaching students – future lawyers, in particular, legal English is “to instill in them the skills of professional formal communication (the study of specific lexical and grammatical structures and the expansion of language capabilities necessary to achieve success in legal practice). The developing of communicative competencies by students of legal specialties involves teaching communication in oral and written forms in Russian and foreign languages to solve the problems of professional activity. Professional competencies include the ability to carry out professional activities in the field of international legal cooperation, as well as the ability to analyze lawmaking, law enforcement, law enforcement and human rights practice, scientific information, domestic and foreign experience in the field of law” [8, p. 69].

Noting the successful dynamics of distance learning, a number of advantages are revealed, which include new opportunities and forms of organizing practical classes, tests and exams in so-called web-classrooms. Through information and communication resources that provide platforms for online lessons in video conferencing, for example, Zoom has become the main system of the Russian State University of Justice, which also provides opportunities for using an interactive whiteboard, chat, broadcasting audio and video materials. The system of express testing has been also promptly established, through the previously personally developed for the university e-learning system “Femida”, which allows the creation of simulators and online tests on the topics covered, allowing you to work out the lexical and grammatical material. In addition, technologies such as online testing allow the teacher to receive quickly test results in an automatic mode, and students to increase their internal self-esteem. Also, in the system of the electronic educational environment, the process of posting useful links to video resources is organized for in-depth study and repetition of the assigned material, as well as independent work. An individual form of work with a teacher through subject regulation and direct appeal of students to clarify the questions that have arisen to the teacher through an accessible contact mechanism provided by the e-learning system is not excluded, thus establishing the form of business correspondence and documentary circulation of the teacher and student.

The use of modern information and interactive means in general is taken into account by educational standards for the traditional form of teaching foreign languages. At present, it is assumed that each student should be provided with access to the system of electronic libraries containing publications in the main academic disciplines, to modern professional databases, information directories and search engines. Educational institutions should provide students with individual, unrestricted access to the electronic system the Internet. The Russian State University of Justice has coped with this task long before the pandemic.

Noting the disadvantages of distance learning a foreign language, it is important to mention the need for additional, individual work, since not all students and teachers have sufficient computer literacy to master online services with this form of education. However, work in this direction has been actively carried out since the beginning of the transition of universities to a distance form. Universities conduct specialized courses and send their teachers to improve their qualifications in this area.

In addition to the lack of knowledge in the field of computer technology, technical problems have emerged that limit access to the educational process. Not all participants have had access to high-speed Internet, allowing them to attend the classes via video communication or to receive this

communication in normal quality [9, p. 147]. In addition, the immediate issue of the urgent purchase of technical equipment has arisen: microphones, webcams and personal computers. Not all students and teachers have been able to provide themselves with the above-mentioned technical means due to their widespread use by all family members who have been in self-isolation on equal terms, and also due to the absence, in particular, of microphones and cameras as unnecessary in their daily life before the pandemic. The mass character of this phenomenon has led to an increase in the user load on the platforms themselves, causing constant technical failures. Poor technical equipment and “unpreparedness of teachers” and unpreparedness of the education system are noted in many works covering the experience of a massive forced transition to a distance learning form [4; 1, etc.]. At the same time, the availability of materials should also be considered as an opportunity to refer to various Internet resources as not only an auxiliary and accompanying means in teaching a foreign language, but also as the main means of teaching language disciplines.

The most critical problem has been the interaction with unscrupulous students who using the different excuses of technical problems and the impossibility of improving them, miss the classes and avoid of participation in the educational process, ignoring the teacher's request. The aspect of the teacher's objective control over the study of the discipline also has undergone its decline, especially it has become noticeable at the stage of intermediate certification, when students can use available Internet resources and other sources of information when checking their knowledge, as a result of which the qualitative aspect also has suffered. In this case, the level of knowledge decreases, and the assessment of the quality of this knowledge does not correspond to the truth [7, p. 103].

In the process of distance learning of a foreign language, a number of problematic points have emerged, which does not allow to properly build or at least bring closer the level of knowledge acquisition, which the traditional live learning form provides. In particular, the remote form, due to its limitations, questioned the methodology for conducting a group dictation in order to check the spelling of lexical units of the previously studied material, since the ability to control cheating and constant communication of students with each other through chat messengers and other communication channels that cannot be tracked has been lost. As a result, control through oral questioning has become the most effective. As practice has shown, other written works, such as essay, writing and presentation have lost their effectiveness, since students have begun to actively resort to easily accessible Internet materials that has been at hand. As a result of it, copying of the text word for word has become aggravated, which nullifies the entire the meaning of the assignment and the individual work of students aimed at using the materials studied and the acquired skills. As for the translation of the text, control over the independence of its implementation has been also complicated due to the active use of the possibilities of Internet translation by students. With regard to the oral aspect, it is technically feasible to break students into small groups for dialogue practice (for example, in the Zoom platform), however, such dialogues are less believable due to the lack of real communication, as in face-to-face classes. All this impedes the achievement of the main goal of teaching a foreign language - the development of communicative competence.

The lack of psychological comfort is indicated by surveys of students who are “dissatisfied with the distance learning form” [10, p. 291]. Of course, we can consider this dissatisfaction as a natural reaction to a sudden exit from the comfort zone, however, when analyzing the experience of self-isolation, one should consider the entire set of factors leading to psychological discomfort. Some stress factors sometimes seem insignificant, but, nevertheless, they must be taken into account in order to think over the system of psychological adaptation of students. For example, with such a factor as “the problem of time management” [10, p. 291], one can successfully work in the pedagogical process, orienting students to the optimal ways of organizing their time. Discomfort associated with the need to work with the camera turned on, with the appearance of family members in the screen, etc., requires separate consideration.

Finally, let us consider the manufacturability and effectiveness of distance learning in the current extreme conditions. If we understand manufacturability as “the use in the educational process of the latest achievements of pedagogical and scientific and technical thought, modern information technologies”, then this is an indisputable advantage of distance learning foreign languages. With

regard to efficiency, it takes time and criteria for its assessment. As rightly noted by O.B. Bolbat and O. Yu. Hekalo, “it is not yet possible to compare the effectiveness of distance education with the traditional form of the educational process”, since in order to observe the progress of students, their involvement in the educational process, the formation of the required competencies, it is necessary “several years, better a full course of study (4–5 years)” [4, p. 97].

The experience of a forced mass transition is strikingly different from the established practice of working with remote technologies, which in extreme conditions have become almost the only chance to continue learning, without the possibility of a smooth transition and gradual adaptation. The emphasized aspect of distance education in self-isolation mode has intensified due to the massive use of electronic means of communication in the absence of other ways and means of interaction in the educational process. The specifics of teaching a foreign language, which presupposes direct communication between the teacher and students and students among themselves, has led to an active search for communication opportunities for the implementation of this communication. Teachers in difficult conditions of self-isolation have been challenged, to which they have tried to answer, not only using what they have known and have been able to, but also expanding their capabilities through urgent self-education and self-study.

Analysis of current problems, along with practical experience, have shown that the effectiveness of learning a foreign language in a distance learning form currently has more disadvantages than advantages, which proves the inferiority of the distance form as the main form that has replaced traditional education, and can only remain additional measure.

At this stage, we can only talk about the beginnings of the emergence of a new form of education with the prevailing use of distance technologies in the learning process, for which the appropriate identification has not been selected, which allows it to be characterized with scientific accuracy. Among the most common classifications, we would put forward the concept of “distant learning”. This term would distinguish a set of concepts related to distance learning in the traditional view, with the ideas of a new form of education as a forced measure of interaction between a teacher and a student, as close as possible to real classroom practice through the use of various digital technologies and devices during the pandemic.

In general, we can say that the period of the pandemic is a kind of breakthrough in the selection and development of didactic materials and in the search for forms of training organization. However, we believe that this breakthrough is carried out, first of all, by the forces of the teachers themselves, and by the technical capabilities that they currently have. Generalization of this experience and analysis of successful findings in the field of teaching a foreign language is a matter of the nearest future, in which it is necessary to combine both innovative computer technologies and traditional teaching methods for the most successful developing by students of communicative competence and the ability to master a foreign language.

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**МЕТОДИКА ПРЕПОДАВАНИЯ ИНОСТРАННЫХ ЯЗЫКОВ И ЕЕ СВЯЗЬ С  
ЛИНГВОДИДАКТИКОЙ И ПЕДАГОГИКОЙ  
FOREIGN LANGUAGE TEACHING METHODOLOGY AND ITS RELATION TO  
LINGUISTICS AND PEDAGOGY**

**Аннотация.** Лингводидактика – это научная дисциплина, которая занимается изучением теории образования и процесса обучения и усвоения языков, а также лингвистическим описанием языка в учебных целях. Обучение и усвоение иностранных языков можно рассматривать как многоуровневый процесс. Основными его уровнями считаются лингводидактика и методика обучения иностранным языкам. Второе можно

выделить как самостоятельную науку, она, как и лингводидактика, напрямую связана с такой наукой как педагогика. Таким образом, обе эти науки, лежащие в основе преподавания иностранных языков, взаимосвязаны и дополняют друг друга: лингводидактика выявляет общие закономерности обучения и усвоения языка, а методика теоретически обосновывает их и практически проверяет различные методы обучения студентов разнообразным языкам. Педагогика, в свою очередь, является наукой-основой, от которой отталкиваются вышеперечисленные дисциплины, являющиеся ветвями педагогики определенной сферы деятельности. Они наглядно применяют методы обучения студентов и других людей, описанные педагогикой. Так, все три науки являются взаимосвязанными и не могут существовать друг без друга.

**Abstract.** Linguodidactics is a scientific discipline that studies the theory of education and the process of language learning and acquisition, as well as the linguistic description of language for educational purposes. Foreign language learning and acquisition can be seen as a multi-level process. Linguistic pedagogy and foreign language teaching methodology are considered to be its main levels. The latter can be distinguished as an independent science, so it is directly linked to a science such as pedagogy. Both these two sciences underlying foreign language teaching are interconnected and complement each other: linguodidactics identifies general patterns of language learning and acquisition, while methodology theoretically substantiates them and practically tests different methods of teaching students a variety of languages. Pedagogy, on the other hand, is the science from which the above-mentioned disciplines, which are branches of pedagogy of a particular field of activity, draw. They visually apply the methods of teaching students and others as described by pedagogy. Thus, all three sciences are interconnected and cannot exist without each other.

**Ключевые слова:** лингводидактика, педагогика, методика преподавания, методы обучения, средства, научно-теоретические основы, дидактика.

**Key words:** linguodidactics, pedagogy, teaching methodology, techniques of teaching, tools, scientific-theoretical foundations, didactics.

In the practice of teaching a foreign language, including Russian as a foreign language, there are two concepts – methodology and linguodidactics and these terms are not synonymous. Many lectures confuse concepts, which leads to ineffective transfer of knowledge to students who, unlike their professors, are not thoroughly familiar with the language being studied and may misinterpret what they have learned. The subjectivity emanating from the teacher is above all related to his/her ability to organize the lesson on a communicative basis, to introduce new lexico-grammatical material, to consolidate it and to bring it to the level of active absorption. The presentation of the material can be inductive or deductive, and the best way of teaching is determined by the teacher himself, depending on the material and the characteristics of the group he is familiar with. Meanwhile, there are also linguodidactic constants which the teacher is guided by. These are the lexical and grammatical linguodidactic units (minimums) for each level of teaching, the stages of lesson organisation, the system of exercises which allow developing linguistic competences and transferring them to the communicative level. These methods should be studied by every teacher or person who wants to take up a foreign language, because they will help you to understand clearly and accurately the structure of an unfamiliar language and to arrange all the knowledge you have acquired.

Methodology can be distinguished as a separate and distinct science because it has such characteristics as object, subject, scientific-theoretical foundations, body of accumulated knowledge, its own conceptual and categorical apparatus, etc. Furthermore, for a long time, methodology was hesitant to be classified as a science. This has led to a desire to define methodology as the applied recommendations of a number of sciences. A detailed justification for this approach was given by P.B. Gurvich who wrote: “Methodology can be defined as a science of how to achieve the best results

in teaching foreign languages on the basis of data from pedagogy, psychology, linguistics and other sciences, in constant connection between themselves and with teaching conditions” [1, p. 14]. In 1974, I. L. Bim, based on a systematic approach to research, defined foreign language teaching methodology as a science developing at the junction of several other sciences and, above all, pedagogy as a general theory of education, didactics as a theory of learning and linguistics [4, p. 6].

Linguodidactics studies the general regularities of foreign language teaching, develops methods and means of teaching a particular language depending on didactic objectives, studies the influence of monolingualism or bilingualism on language acquisition and solves a number of related problems. The aim of this science is to identify the main regularities of the foreign language teaching process in order to provide an objective scientific basis for evaluating the effectiveness of teaching methods and their further improvement. This science, according to R.K. Minyar-Beloruchev is an independent science, including theoretical and practical methods of teaching foreign languages, and the main task of linguodidactics is to develop a methodology of teaching a foreign language.

The main aims of linguistic pedagogy are [2]:

- selecting relevant and useful language skills, abilities and knowledge;
- identification of the regularities of the foreign language learning process;
- development of the most effective ways and methods of teaching foreign languages;
- determining the content of language education.

Linguodidactics is directly linked to foreign language learning methodology through what the two sciences are based on. They are founded on the following three components: the teacher's learning activity; the organization of the learning process (objectives, content, methods, techniques and tools); and the students' learning activity.

Let us consider these three components in more detail. A teacher's learning activity is an activity aimed at shaping the system of knowledge, skills and abilities of students, which includes both developmental and educational objectives of the individual. This aspect is one of the most important because it allows the lecturer to establish a rapport with his or her students and to understand whether visual images or simple theory-based texts are better for them to absorb. The next component is an organization of the learning process. As described above, this item includes such things as objectives, content, methods, techniques and tools. This point follows the method of teaching, as it reveals the very ways of transferring knowledge directly to the learner. Learning activities are designed to develop learning that supports course outcomes. All learning activities should support course outcomes, and all course outcomes need to be supported by learning activities. The essence of a learning activity is that it must have an associated learning outcome. However, it must also have a task, that is, something concrete that the learner has to do. Learners may also need resources (sometimes called content) in order to be able to complete the task. Tools are a category of dynamic and interactive educational instrument, that make learning engaging for the students. They give life to your lessons with sound, videos, infographics, assessments, quizzes, and animation.

There are also 13 types of teaching methods and techniques [6]:

- Think-pair-repair (in this “thinking in pairs” option, pose an open-ended question to the class and ask the students to come up with their best answer. Then pair the students up and ask them to agree on an answer. Put the two pairs together and have the foursome do the same. Continue until half of the group is paired with the other half);

- Improv games (when a museum-level silence reigns in your classroom, no matter how hard you try to liven things up, try some low-impact improvisational exercises. In the “Three Commonalities” game, pairs identify the most unexpected commonalities. Alternatively, invite the students to count to 20 as a group, with one person having to say each number – but no one is assigned a number, and if two people speak at the same time, everyone starts with 1);

- Brainwriting (in this approach, students are given time to come up with their own ideas individually before sharing them out loud or posting them to an online whiteboard or other shared platform. Building in space for individual reflection leads to better ideas and less groupthink);

- Jigsaw (help students build accountability by teaching each other. Start by dividing them into “home groups” (4 or 5 people work well). Assign each person in the group a different topic to

explore – they’ll regroup to work with all the students from the other groups who are exploring the same idea. Once they’ve mastered the concept, students return to their home group and everyone shares newfound expertise);

- Concept mapping (collaborative concept mapping is a great way for students to step away from their individual perspectives. Groups can do this to review previous work, or it can help them map ideas for projects and assignments);

- The one-minute paper (at the end of class, set a timer and ask students to record their most eye-opening revelation or biggest question. This activity lets students reflect on learning and build writing skills – plus you will get a window into their understandings and misunderstandings);

- Real-time reactions (when students are watching a video, a mini lecture or another student’s presentation, have them share their real-time reactions. This helps students spot trends and consider new points of view);

- Chain notes (write several questions on pieces of paper and pass each to a student. The first student adds a response and then passes the page along to gather more responses. Multiple contributions help build more complete understanding. Then your class can examine the responses and identify patterns and missing pieces);

- Idea line up (choose a question that has a range of responses, and then ask students where they stand – literally. Have them come to the front of the classroom and organize themselves in a line, based on where on the spectrum of answers they find themselves);

- Mystery quotation (test how well students can apply their understanding of an issue or theoretical position. After they have explored a topic, show them a quotation about it they have never seen before. Their task is to figure out the point of view of the person behind the quotation – and justify it to the class. Students can debate this issue in small breakout groups before beginning a whole-class discussion);

- Idea speed dating (have students cycle through your space, sharing insights about a topic or their elevator pitch for an upcoming project. As they present their learning multiple times on several “speed dates”, students’ presentation skills and perspectives will grow);

- Peer review (the process of peer review is as old as academia, and it is never too early to start. Have students swap drafts of their essays, proposals or lab reports, and then come up with comments and questions for each other. Make sure to be clear about what the goals are);

- Sketch noting (instead of taking traditional lecture notes, try getting your students to sketch a picture that represents what they have learned during class. Remember, it is not about the quality of the art – it is about how drawing prompts students to visualize their understanding and look at their learning from a different perspective).

All of the above aspects also illustrate pedagogy as the science of teaching a subject through various forms of play and conversation.

Pedagogy is the science of human upbringing and education, especially during childhood and adolescence. The subject of pedagogy is the holistic pedagogical process of directed personal development and formation in the conditions of upbringing, training and education. The main objective of pedagogical activity in modern conditions is the formation of a versatile personality capable of realizing its creative potential in dynamic socio-economic conditions, both in its own vital interests and in the public, state interests [5].

Above all, methodology is linked to pedagogy and didactics because they share a common object, looking at education and upbringing in the process of educating schoolchildren in different settings. At the level of didactics, which distinguishes learning as its object, it is the unity of teaching and learning as the activity of transferring the content of education. Finally, at the level of methodology it is a set of forms of implementation of educational activities on the material of a particular subject, in our case a foreign language. It follows that the most significant connections between methodology and pedagogy and didactics. For this reason, didactic principles reflecting general patterns of learning have always been used in the teaching of foreign languages.

At present, a gradual replacement of the term “foreign language teaching methodology” with the term “linguodidactics” and an increase in their use as synonyms is being recorded. For instance,

in some higher education institutions the departments of methodology are being renamed as departments of linguodidactics. Some authors suggest replacing the term “methodology” with “linguodidactics”, citing examples from abroad. However, this is not entirely correct. The results of linguodidactic research are important for foreign language teaching methodology. For example, linguodidactic models such as “communicative competence” and “linguistic personality” have proven to be important for methodology. “Communicative competence” is widely accepted among methodologists [3, p. 73] as it focuses on the communicative and pragmatic nature that contributes to human communicative abilities [3]. “Linguistic personality” is a set of language abilities, skills and abilities of speech activity. Methodology, adopting this concept, contributes not only to the formation of language skills, but also to the acquisition of ways of thinking and consciousness, personal attitudes, the system of values of the peoples who speak the language under study [3, p. 209].

The impossibility of directly transferring didactic principles to educational methodology is quite obvious from the following example. Since the time of Jan Amos Comenius the principle of accessibility has been formulated – which implies learning material from easy to difficult. If we apply this principle directly to the teaching of foreign languages, then studying the use of the article should not be at the first stage of teaching, but closer to the end, because due to the lack of grammatical consolidation of definite/undefined in Russian, the use of the article has special difficulties. The use of didactic principles in a transformed form caused disputes among methodologists about their status. Some methodologists (R.K. Minyar-Beloruhev, G.V. Rogova) thought that didactic principles, refracted in their own way in language teaching, should be regarded as methodological. Another group of methodologists (I. V. Rakhmanov, A. A. Mirolubov, E. I. Passov, S. F. Shatilov) distinguish between didactic and methodological principles [4, p. 10]. Analyzing these approaches, it should be admitted that the second group of methodologists is more right from a methodological position because no matter how peculiarly didactic principles are used, they remain common for all subjects studied in schools.

It is clear from the above that the links with pedagogy and didactics are fundamental to methodology. Thus, in every aspect of methodology, whichever one we choose to examine more closely, there are subtle and close links with the related sciences of didactics, pedagogy and linguodidactics. This topic is still relevant today, not only for teachers but also for students. Teachers can choose the methods that are most understandable for students and illustrate particular rules, while students are able to study the curriculum, determine which methodology their teacher uses and be able to organize their own independent work.

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## **ПРОБЛЕМА ПЕРЕВОДА МАНУСКРИПТА ВОЙНИЧА THE PROBLEM OF TRANSLATING THE VOYNICH MANUSCRIPT**

**Аннотация.** В публикации рассматривается одна из самых известных загадок криптографии последних десятилетий – средневековый иллюстрированный кодекс, получивший название Манускрипт Войнича. За годы исследования текста математики, лингвисты, программисты различные исследователи, занимающиеся данным вопросом, так и не пришли к единому мнению о природе кодекса. Написан ли манускрипт на естественном языке, или это скрупулезная подделка, или даже особый тайный шифр достоверно неизвестно. Существует множество предположений по поводу происхождения, содержания, исторического значения, авторстве рукописи и языка, на котором манускрипт Войнича был составлен. Все эти вопросы рассматриваются в данной публикации с различных точек зрения. Особое внимание уделено выдвинутым теориям относительно содержания данного документа и процессам его дешифровки, в чем выражается трудность его перевода исследователями.

**Abstract.** This publication examines one of the most famous cryptographic mysteries of recent decades: the medieval illustrated codex, called the Voynich Manuscript. Over the years of research on the text, mathematicians, linguists, programmers, and various researchers concerned with the issue have never reached a consensus on the nature of the codex. Whether the manuscript is written in natural language, or it is a meticulous forgery, or even a special secret code is not known. There is much speculation about the provenance, content, historical significance, authorship of the manuscript, and the language in which the Voynich manuscript was written. All of these questions are addressed in this publication from a variety of perspectives. Particular attention is paid to the theories that have been advanced about the content of this document and the processes of deciphering it, which is what makes it so difficult for researchers to translate.

**Ключевые слова:** манускрипт, Войнич, теория, дешифровка, перевод.

**Key words:** manuscript, Voynich, theory, decoding, translation.

For many centuries, mankind has always been beckoned by the unknown: deciphering documents, studying the construction plans of ancient structures, who creates mysterious artefacts,

how do we understand and use them, as well as many other things. Some things are solved, over some things mankind is still beating in unsuccessful attempts to get even a little closer to the solution. Things previously mystified can now be understood and appreciated. This has shaped our view of the world, the universe, nature, psychology, and many every day and beyond. In all of this, we are aided by science, and by people who have devoted their lives to answering questions of how, why, who, and when. And you may be surprised that even if the development of science has reached such heights and technological progress is moving forward by leaps and bounds, there are still many different unsolved mysteries that excite and drive even the best and brightest researchers crazy.

That is the reason why I want to pay attention to one of the most famous cryptographic mysteries of recent decades, the debates and speculations about which continue to this day, is a medieval illustrated artistic codex, called the Voynich Manuscript.

The Voynich Manuscript, is the most enigmatic artistic text in the world. Many theories and assumptions have been put forward by researchers of this document regarding its content, meaning, and historical significance. And some of these theories are completely opposite extremes. Reliably unknown until now is neither the author, nor the origin, nor the language that was used to write the manuscript. One thing, however, that the researchers have found a point of convergence is the time of origin of the source. Presumably the Middle Ages, and more precisely, the beginning of the 15th century, the early Renaissance.

The manuscript is named after the antiquary Wilfred Voynich, a Polish revolutionary and owner of a number of bookshops in London and New York, who acquired it in 1912. In 1961 his heiress, Ethel Voynich, sold the manuscript for \$24,500 to the bookseller Hans Kraus, who already in 1969 donated it to the Beinecke Rare Book Library at Yale University, where the manuscript is presently kept [3, p. 22].

Opinions differ as to the authorship of the manuscript. One of Jan M. Marzi's letters to Athanasius Kircher mentions Emperor Rudolph II as one of the owners of the manuscript, who believed that the book's author was the gifted Franciscan monk and scholar Roger Bacon. Nowadays, however, scholars familiar with Bacon's works have denied this possibility. But the suggestion that Roger was the author of the manuscript led Wilfred Voynich to conclude that the only person who could have sold the work to Rudolph II was John Dee, the mathematician and astrologer at the court of Elizabeth I, who was also famous for having an enormous library of Bacon manuscripts at her disposal. The theory is that Dee himself was the author of the manuscript, but spread the rumor that it was Bacon's work, hoping to sell it at a profit. And the last of the popular assumptions about the authorship of the manuscript is Edward Kelly, the English mystic and alchemist.

The Voynich manuscript is a manuscript codex measuring 23.5 by 16.2 cm and is 5 cm thick. The book is partially damaged and incomplete. Researchers agree that the now known 240 pages lack 32 more, which were lost over the years when the document changed hands. In fact, it is interesting that some of the pages are collapsible, that is, they are larger in width than the others [1]. The manuscript is illustrated in considerable detail, suggesting that it contains some knowledge of medieval science or medicine. The grouping of images makes it possible to divide the document into six sections:

1. Botanical. Includes depictions of plants, some of which are unknown to modern science.
2. Astronomic. It contains illustrations of stars, the moon, the sun, as well as symbols of zodiacal constellations.
3. Biological. Contains continuous text flowing around depicted human figures-mainly nude women bathing in certain tubs connected by pipes.
4. Cosmological. It is dominated by circular diagrams of incomprehensible purpose.
5. Pharmaceutical. Lots of signed plant parts associated with images of apothecary vessels in the margins of the pages.
6. Prescription. Section consists of short paragraphs separated by flower or star-shaped markings.

The impression given by the remaining pages of the manuscript suggests that it was created as a pharmacopoeia or a separate part of a book of medieval or earlier medicine.

Perhaps the manuscript is some kind of herbal medicine book of a medieval alchemist. Because in the text one can clearly trace the emphasis on plants and methods of treatment of human beings. Astronomy, mentioned in some sections, is an accompanying applied science that allows the reader to orient himself as to when to gather certain plants, herbs, flowers, and so forth.

The document is written in symbols never before seen in any of the ancient documents that have come down to us. A typeface of signs assembled into words was used. In the text, we do not see long words or short ones consisting of one or two letters. Supposedly the alphabet contains no more than 30 letters.

Cryptologists who have studied the Voynich manuscript note that some of the letters resemble the Greek and Latin alphabet, while others resemble Hebrew or Arabic hieroglyphs. Also, some of the words may resemble the language of the Polynesians.

The first attempts to decipher the manuscript were made as early as the 17th century by the Czech scientist Jan M. Marzi and the German scientist Athanasius Kircher. Their efforts, as well as those of Voynich himself, had little success.

Let us consider what hypotheses were put forward when trying to decipher this manuscript.

The popular hypothesis is the code book. According to this theory, the words of the manuscript are codes contained in a special book or dictionary, helping to decipher it later. An analogy was made with Roman numerals, which in the Middle Ages were often used to cipher books and manuscripts. This method was used mostly only for small texts and notes, as it is very hard to read and write. From which we can conclude that such codes are not intended for encryption of books and manuscripts.

In 1912 William Newbold, a professor of philosophy and a collector of ancient manuscripts, put forward a theory which was later called micrography. Its essence is that the text of the document visible to us carries no meaning. But it is important to pay attention to the little dashes, also located on the page, which may be the secret code. This method can be compared to shorthand used as early as in ancient Greece. The scientist claimed that he had managed to decipher a part of the text with this method. Later, this theory was refuted by John Manley, who proved that these dashes were not in the text originally, but appeared over time as a result of the drying and cracking of the ink.

According to the steganography hypothesis, the text of a manuscript has no meaning, but only contains encrypted elements that can be deciphered only by the individual elements of the text (for example, the number of characters in a line, the fourth letter in each word or sentence, the number of consonants, etc.).

It remains to mention the hypotheses that are closest to linguistics and quite fully reflect the problems of translation.

The working theory of the informal group of cryptanalysts led by William Friedman in the 20th century is that a document contains meaningful text in a European language which has been deliberately translated into unreadable text using an encoding algorithm applied to individual letters rather than whole words or sentences. The rebuttal is that the manuscript does not match the results of the encryption systems of the era.

The same Friedman and John Tiltman independently concluded that an artificially created language was used to write the manuscript. It was designed in such a way that in order to decipher the meaning of a single word he had to rely on a sequence of letters.

The linguistic scholar Jacques Guy believed that there was a possibility of using an exotic language of natural origin using the invented alphabet. Indeed, the structure of words bears a resemblance to East Asian languages, and in particular some graphic elements are characteristic of Chinese manuscripts.

And, of course, it is worth mentioning Leo Levitov's hypothesis of a multilingual text. In his book "Solution of the Voynich Manuscript: A Liturgical Manual for the Endura Rite of the Cathari Heresy, the Cult of Isis" he stated that the unencrypted text of the manuscript is nothing more than a transcription of "the oral language of the polyglot". He presented a partial transcription in the form of a fusion of medieval Flemish with various borrowings of old Upper Germanic and Old French words. However, this theory caused many doubts and was not further propagated [2].



When researchers conducted a statistical analysis of the text, they found the structure of the manuscript to be typical of natural languages. For example, the vocabulary entropy (about 10 bits per word) is similar to Latin and English, and the repetition of words corresponds to Zipf's law, according to which in a natural language the most used words will be the shortest.

An active study of Voynich manuscript is continuing at the present time; almost every six months or year there are reports of new discoverers. But it is worth noting that all this is happening with the involvement of neural networks, the accuracy of the analysis of which is about 97 percent. Canadian researchers from the University of Alberta have thus found that the most likely language of this manuscript is Hebrew. But it is worth noting that the system also gave other possible inputs: Mozarabic, Mazatec, Italian and Ladino, elements of Arabic and Amharic were also possible. This approach was unexpectedly quite effective, and most of the book was translated. The first phrase was translated as: She made recommendations to the priest, man of the house and me and people. But these results were not accepted by the scientific community, because the neural network could miss possible translation variants and did not reveal the features and principles of the language, as required by a full linguistic analysis, which only humans can do at the moment.

It is also worth noting the option of possible edits. Rene Zanzbergen of the European Space Agency put forward the theory that the document has multiple edits. And that we are not dealing with one text, but with several at the same time. This is indirectly confirmed by computer analysis of the parchment sheets, which showed that the text has been retouched. However, at this point in time it is impossible to restore the original text and separate it from possible later layers.

The difficulties faced by the researchers of the Voynich manuscript are dictated by the fact that it is quite difficult to assemble a team of specialists of different nature, for example, mathematicians, linguists, cryptographers, programmers, which would allow to conduct a multidisciplinary study of this document simultaneously.

The results of recent studies allow us to say with certainty that the manuscript was written in a real language and is not a forgery, nor is the message contained in it encrypted. All this is confirmed by the complex structure of the content of this text, the construction of sentences, the structure of words, the combination of symbols, spelling and punctuation.

The mysterious manuscript unites the whole world, all countries and all nations – mathematicians, linguists, cryptologists, conspiracy theorists, programmers and many others are studying it. Even though it is of great international interest, society cannot offer an acceptable and sufficient solution to the problem, and so the mystery of the manuscript persists. Not only professionals, but also various enthusiasts are working on translation attempts, so there are many materials in the public domain for study and discussion. For example, the Beineke site or the Voynich manuscript site of René Zandbergen, which include detailed reviews of each facet of the manuscript, current bibliographies, and a variety of theories and proposed solutions.

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**ОСОБЕННОСТИ ПЕРЕВОДА НАУЧНЫХ ТЕКСТОВ (НА ПРИМЕРЕ СТАТЬИ  
“BLACK HOLES ARE FINALLY TRENDING” И ЕЕ ПЕРЕВОДА НА РУССКИЙ ЯЗЫК  
SPECIFIC FEATURES OF TRANSLATION OF SCIENTIFIC TEXTS  
(BY THE EXAMPLE OF THE ARTICLE “BLACK HOLES ARE FINALLY  
TRENDING” AND ITS TRANSLATION INTO RUSSIAN)**

**Аннотация.** Цель данной статьи заключается в рассмотрении и анализе особенностей перевода научных текстов. Объектом исследования являются научные тексты. Предмет исследования составляют особенности перевода научных текстов. Эмпирической базой исследования является статья “Black Holes Are Finally Trending” (Scientific American Journal) и ее перевод на русский язык (ИНОСМИ.РУ). Важнейшей проблемой достижения эквивалентности перевода научных текстов является передача исходного содержания текста с помощью терминосистемы переводного языка. В работе приведены особенности научных текстов, выявлена специфика их перевода на русский язык. Так как для данного исследования особый интерес представляли термины, то были также проанализированы их характеристики. В результате проведенного анализа терминов мы выяснили, что наиболее продуктивным способом перевода является эквивалентное соответствие.

**Abstract.** The article examines and analyses the features of translation of scientific texts. The object of the study is scientific texts. The subject of the research is the specific features of the translation of scientific texts. The empirical basis of the study is the article “Black Holes Are Finally Trending” (Scientific American Journal) and its translation into Russian (INOSMI.RU). The most important problem in achieving equivalence in the scientific text translation is to interpret the original text content using the terminology system of the translated language. The work shows the characteristics of scientific texts and reveals the specifics of their translation into Russian. As terminology was of particular interest for this study, we have also analysed its features. The analysis of the terminology has revealed that the most productive method of translation is equivalent correspondence.

**Ключевые слова:** научный текст, терминосистема, способы перевода, лексические трансформации, грамматические трансформации.

**Key words:** scientific text, term system, translation methods, lexical transformations, grammatical transformations.

Translation of scientific texts is an essential part of the work of any professional translator. However, a translator who is fluent in a foreign language may not always be able to translate a scientific text correctly. Translation of scientific texts may be inadequate because the translator misunderstands the meaning of the text and scientific and technical terminology, which will result in significant distortion of the meaning of the translated material. In order to translate a scientific and technical text correctly, it is necessary to know the basic features of scientific style in general.

The scientific and scientific and technical type includes texts of scientific articles, monographs and technical descriptions. The field of knowledge does not have a fundamental importance for the design of the text. Its typological features for any topic are quite stable. They are determined primarily by the dominant type of information, that is, cognitive [1, p. 267].

The features that characterize all scientific texts are: special terminology; strict syntax and sentence order; accuracy; lack of emotionality; objectivity; impersonality.

Translation of scientific and technical texts should comply with the following requirements: equivalence, adequacy, informativeness, consistency and clarity [4, p. 423–426].

The issue of the problems of terminology translation has always occupied a special place in the works of Russian and foreign academics. If the task of translation is to ensure equivalence as a common content of the original and translated texts, then particular attention should be paid to terminology while translating special texts.

According to their structure, all terms can be divided into two groups: simple terms (consisting of one word), compound terms (consisting of two words) and phrase terms (consisting of more than two words).

According to L.S. Barkhudarov [2, p. 73], the terminology translation methods include transliteration, transcription, loan translation, descriptive translation, analogical correspondence, and translation transformations. V.N. Komissarov lists such methods of translation as borrowing, loan translation, creating analogues in the translating language, lexical substitutions, null translation, approximate translation, and transformational translation [3, p. 187].

In order to successfully translate scientific literature, the translator must operate with certain vocabulary, including special terms; understand the specific grammatical constructions of a foreign language's scientific style; know the lexical, grammatical and stylistic rules of translation; use a dictionary; and be familiar with the specific field of scientific knowledge to which the translated text refers.

The study was based on the article “Black Holes Are Finally Trending” published in Scientific American online magazine by Avi Loeb on 7 November 2020. Its translation into Russian was published on 10 November 2020 on the INOSMI.RU website.

The article says that although black holes have been studied theoretically for a long time, they constantly present new surprises to researchers. But now black holes are trending again, so far that in 2020 the Nobel Prize in Physics was given to three scientists who study them.

19 English terms and their translation into Russian served as background material. The terms were selected by continuous sampling.

After analysing the selected material, it was found that 16 terms were translated using the equivalent correspondence method:

- (1) *black holes* – *черные дыры*;
- (2) *speed of light* – *скорость света*;
- (3) *event horizon* – *горизонт событий*;
- (4) *nonspinning black hole* – *невращающаяся черная дыра*;
- (5) *solar system* – *солнечная система*;
- (6) *supermassive black hole* – *супермассивная черная дыра*;
- (7) *light ring* – *кольцо света*;
- (8) *spinning black hole* – *вращающаяся черная дыра*;
- (9) *singularity* – *сингулярность*;
- (10) *spacetime curvature* – *искривление пространства–времени*;
- (11) *matter* – *материя*;

- (12) *quasars* – квазары;  
 (13) *orbital planes* – орбитальные плоскости;  
 (14) *black hole evaporation* – испарение черной дыры;  
 (15) *entropy* – энтропия;  
 (16) *solar system* – солнечная система.

1 term was translated using a generalisation transformation:

- (17) *gravitational tidal force* – гравитационная сила.

Also 1 term was translated using the concretisation transformation:

- (18) *spacetime* – пространственно-временной континуум.

The contextual correspondence method was used once:

- (19) *outflows* – исходящие потоки.

Besides the lexical transformations mentioned above, the comparative analysis of the original and translated texts also revealed grammatical transformations.

8 sentences were translated by addition, 4 by sentence fragmentation, 2 by omission and 1 by substitution of a grammatical category. For example:

(20) *In 1939, Albert Einstein wrote a paper in **Annals of Mathematics** doubting that black holes exist in nature.* – В 1939 году Альберт Эйнштейн написал работу для журнала «**Анналы математики**», где усомнился в существовании черных дыр (addition).

(21) *Not only did they measure the mass of the black hole, **but they also tested Einstein's theory of gravity**.* – Но они не только измерили массу черной дыры. **Они также проверили теорию тяготения Эйнштейна** (sentence fragmentation).

(22) *They are described by mass, charge and spin, yet as Jacob Bekenstein **first recognized**, they carry a huge entropy.* – У них три характеристики: масса, заряд и вращение. Но как **показал Яков Бекенштейн (Jacob Bekenstein)**, они также обладают колоссальной энтропией (omission).

(23) *He also showed that it is possible to extract energy from a spinning black hole as if it were a flywheel, through the **so-called** Penrose process.* – Он также показал, что из вращающейся черной дыры возможно извлекать энергию, как если бы она была маховиком. Такое извлечение энергии **назвали** процессом Пенроуза (substitution of a grammatical category).

To conclude the analysis of transformations, the interpreting of the original text content using the terminology system of the translated language is a major problem concerning achieving equivalence in the translation of scientific and technical texts.

Thus, analysis of the terms in “Black Holes Are Finally Trending” showed that in most cases the terms are translated using the equivalent correspondence method. Among all the terms presented, it accounted for 85%. Generalisation transformation – 5%, concretisation transformation – 5% and contextual correspondence method – 5%. Furthermore, grammatical transformations, such as addition, sentence fragmentation, omission, and substitution of a grammatical category, were identified.

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**ГАЗЕТНАЯ ЖУРНАЛИСТИКА  
В УСЛОВИЯХ ТРАНСФОРМАЦИИ СОВРЕМЕННЫХ МЕДИАСИСТЕМ  
NEWSPAPER JOURNALISM IN THE CONTEXT OF  
THE MODERN MEDIA SYSTEMS TRANSFORMATION**

**Аннотация.** Газетная журналистика в настоящее время пребывает в состоянии неопределённости, когда её влияние буквально поглощают интернет-издания, которые становятся лидирующими на рынке СМИ и привлекают аудиторию цифровой эпохи своей актуальностью, привычностью и оперативностью. Газеты теряют своего читателя, исследователи пророчат прессе скорое вымирание, издержки постоянно растут, а редакции не видят оптимистичного будущего для газетной журналистики и поэтому активно адаптируют свою профессиональную деятельность в интернете. Однако мы можем заметить, что пессимистичный процесс вымирания печатных изданий происходит весьма медленно и без существенных изменений. В результате возникают следующие вопросы: действительно ли положение газетной журналистики так ужасно и не имеет других путей? Почему при однозначном взгляде на будущее печатных изданий, они продолжают существовать, развиваться и быть востребованными у аудитории? Почему газеты могут погибнуть, учитывая их историческое значение, так быстро и без возможности адаптироваться и остаться влиятельным игроком на рынке СМИ?

**Abstract.** Newspaper journalism is currently in a state of uncertainty, when its influence is literally absorbed by online publications, which are becoming the leading media in the media market and attract the audience of the digital age with their relevance, familiarity and efficiency. Newspapers are losing their readers, researchers predict an imminent extinction for the press, costs are constantly growing, and editorial offices do not see an optimistic future for newspaper journalism and therefore

are actively adapting their professional activities on the Internet. However, we can observe that the pessimistic process of extinction of print media is proceeding very slowly and without significant changes. This raises the following questions: Is the plight of newspaper journalism really that dire and has no other path? Why, with an unambiguous look at the future of print media, do they continue to exist, develop and be in demand among the audience? Why can newspapers die, given their historical significance, so quickly and without the ability to adapt and remain an influential player in the media market?

**Ключевые слова:** газетная журналистика, стратегия, развитие, интернет, мультимедийные технологии, конвергенция.

**Key words:** newspaper journalism, strategy, development, internet, multimedia technologies, convergence.

The mass media appeared quite a long time ago, at the moment when the first printed editions found their regular readers, that is, a mass audience. The main factor in the emergence of the newspaper as a media was the demand of society to consume and disseminate information. The development of the industrial revolution and the emergence of market relations led mostly to this. It was also driven by the necessity to build a successful business model based on availability and wide coverage.

From the end of the 20th century to the beginning of the 21st century, the era of digitalization began in the world and fast technological progress created the necessity for rapid and significant transformations in the media system [1]. As a result, the importance of newspaper journalism which has come under attack from technology development, began to decline due to the growing popularity of the Internet among users and the creation of completely new electronic media. As a result, print media began to look for a format in which they can develop, answering the questions: “Should we use new information technologies in our business model?” “Should we stay true to the characteristics and features of the print media?” “Should we completely abandon the paper format for providing information?” and many others. Different media react to them in their own way, which demonstrates the uncertainty of the future development of newspaper journalism.

For example, some researchers are very pessimistic about the fate of the print press. Media researcher A.A. Miroshnichenko in his book “When the Newspapers Die” in 2011 expressed a very categorical opinion that the traditional print press would have disappeared by 2035. And even today, the theorist still keeps to these judgments. In the article “Media and coronavirus: demand for news has grown but business has collapsed” (April 6, 2020), Miroshnichenko expresses the idea that the coronavirus pandemic has made the situation of newspapers even more depressing. He believes that radio and TV have a chance to “return to the old gentle trajectories of extinction”, but newspaper journalism does not have such a chance due to the fact that now it is losing advertisers and readers.

However, we can not only disagree with the opinion of the author but also argue this idea. Since there are very obvious reasons for the disappearance of the “paper”, most of the largest federal media in Russia do not stop publishing their paper versions regularly in large edition even after the introduction of Internet technologies. Furthermore, after the pandemic there are still a large number of people who are really interested in periodicals.

The prevailing uncertainty in choosing the right development strategy has led to the fact that nowadays newspaper journalism is represented by a variety of publications, which have adopted the new trends in the media market. Some of them, even with lower economic benefits and higher costs of paper version production, do not want to switch to online completely and adapt to new platform. Thus, the print media are not guided by the opportunities that the network can provide but by completely different factors. O.V. Smirnova reviews the state of newspaper journalism, highlighting three main strategies that are currently most common in the print media market [4].

1. A strategy for digital development of newspaper journalism.

This development strategy involves the formation of multi-platform media. However, the creation of the online version of the newspaper does not immediately imply a complete rejection from the print format but simply requires supplementing it with new tools that will attract the audience attention as well as remain faithful to tradition. As a result, the work of the journalist is becoming more complicated as he should pay attention to the development of digital competencies and skills.

2. A strategy for maintaining a high level of journalists' professionalism and the quality of the publication content.

The strategy provides to newspaper journalists to develop unique skills and competencies that will help them maintain a high level of professionalism. It supposes the development of newspaper journalism to make it an unusual alternative in the digital world increasing its appeal to the audience. However, the strategy should consider traditional skills – it should maintain the current developed, time-tested competencies of the newspaper journalism.

3. A strategy for restoring the reputation of newspaper journalism as functional and relevant to the reader.

The obvious problem of newspaper journalism at the moment is the simplification of the plots of publications, departure from analytics and the individual employees' skills. This is due to the high availability of information on the Internet. Because of this, journalists often turn to cheaper or free sources, including information from blogs. So, this certainly makes the work of a specialist easier. However, the value of such information decreases every day.

Nevertheless, I cannot fully agree with O.V. Smirnova's point of view since the three listed strategies for the development of newspaper journalism do not look like obvious alternatives. Now almost every media strives to use converged and multimedia development ways in order to present their product in the best possible light, as new, high-quality and socially useful. And even if there is no desire to publish an electronic version of newspapers, they still use the Internet as a platform for spread the information about their agency, for example, on social networks. You should also pay attention to the fact that digital development cannot always lead to success, because in such an environment it is very difficult for publications to become competitive and attract mass audience.

For several centuries the distinctive features of newspaper journalism have been high quality, reliability and authority of information, a high-quality approach to writing journalistic materials. These properties have always set periodicals apart other media, therefore, in the modern world, in order to survive and restore their high reputation, newspapers need to carry out a deep and high-quality procedure that involves a return to the origins. Consequently, one of the crucial strategies for the survival of newspapers in the modern world is maintaining the quality and exclusivity of content through high editorial standards.

Until now, newspapers remain a familiar and convenient source of information for many people. Despite the emergence of the Internet and other types of information technology, the majority of the audience still prefers to honor traditions and receive information from printed publications. This fact is confirmed by sociological polls and studies of the ambiguous opinion of the citizens of the Russian Federation about the fate of newspaper journalism in our country. According to a survey by the All-Russian Center for the Study of Public Opinion (VTsIOM) dated January 10, 2018, 79% of Russians are not yet ready to completely refuse paper versions of publications, despite the fact that the consumption of information from newspapers in Russia has dropped from 77 to 55 % since 2014 [6]. In addition, according to the center's survey in 2015, every second Russian (51%) prefers to read an article of interest to him in a print rather than an electronic edition.

We can see that newspapers find it increasingly difficult to survive due to the huge economic costs of production. Printing remains a rather expensive process, which does not pay off with a decrease in overall demand due to the transition of the audience to the Internet. Therefore, it is very important for print media to add value to the information they provide, to convince the target audience to buy the newspaper, even at a fairly high retail price or by a subscription. Newspapers that have opted for a strategy of publishing quality editorial content have the potential to remain distinctive and economically profitable by providing exclusive and informative content. This is the main guarantee



of the success of all newspaper journalism today, which can lead to the sustainable survival of even the smallest print media.

Over time, technology has led to the emergence of media that exist only on the global network. This is due to the emergence and development of convergence - the process of merging traditional and new media. Now, researchers such as E.A. Baranova, A. Kolesnichenko, O. A. Dmitrieva came to the conclusion that the Internet today should be considered as the future and the basis of media technologies in the XXI century [3].

In the collective monograph "The fate of the print press in the era of the Internet" S.S. Raspopova, in her chapter "Converged Editorial as the Next Stage in the Development of Media", identifies several reasons for the emergence of convergence. These include, first, the need for newspaper journalism to "keep up with the times," and second, the need to establish control over the media. In her opinion, the main feature of the functioning of the converged editorial office is a very thorough preparation and planning of content, which will be decorated not only with the help of text, but also with the help of photo, video, audio materials and infographics [5].

In confirmation of the above, one can cite the opinion of the researcher K.A. Karjakina that under the influence of the latest global processes such as globalization and digitalization, the transformation of media systems took place and the formation of completely new media began, which influenced the transformation of the information environment. She came to the conclusion that the modern media space lives according to fundamentally new laws that have a direct impact on the creation and release of materials and, of course, on the work of journalists. It is characterized by the use of the latest multimedia technologies to create unique content, an increase in the speed of receiving, consuming, processing and disseminating information, a change in the journalist's feedback model with the audience, and the emergence of new channels of communication between users [2].

Many researchers such as Yu.P. Purgin, E.L. Vartanova, O. V. Smirnova and A.V. Vyrkovsky are confident that the development of newspaper journalism in the modern world is possible with the use of the right development strategy using new digital technologies. And now we see a huge number of print media that have chosen a digital development strategy newspaper journalism, which was mentioned above, having both their own website and a paper version of the newspaper, despite the fact that today the audience prefers the Internet version. Among the most significant examples of such newspapers are Vedomosti, Kommersant, and Komsomolskaya Pravda, which were originally just paper editions, but over time they created a newspaper website on the Internet.

Electronic newspapers gradually began to oust printed products from the market, one of the clear signs of this fact was the decrease in the number of printed editions. So, according to Interfax from January 13, 2020, the register of registered media contains 42 thousand 861 periodicals. In 2009 the number of registered periodicals was 72 thousand 498, then in 2018, according to Roskomnadzor, but after 9 years, their number dropped to 47 thousand 883 [7]. This can also be seen comparing the printed and electronic versions of the same publication, for example, the newspaper Moskovskaya Pravda, one of the oldest urban newspapers in Russia. From 1918 to 2016, the newspaper remained faithful to paper and was published exclusively in print, however, profound qualitative changes in the information field led the editor-in-chief to the idea that an electronic version of the newspaper was needed. As a result, the newspaper which had been on paper for almost a century not only acquired its electronic version but also made it more attractive and prevalent in the editorial office. The printed version began to appear only once a week, but the electronic version is published daily.

Over time, the advantages of online publishing began to emerge more clearly and clearly. First, such media have the potential to gain many more readers. Every day more and more users visit Internet sites, which means that the number of Internet users is much higher than that of consumers of periodicals. In addition, online versions of newspapers and any other types of media allow you to use links to navigate between pages, headings, blogs, and so on. And no printed version of the newspaper can provide such an opportunity. This not only makes it more convenient to select the information of interest to the reader, but also to find it faster, saving time significantly. It can also be noted that the cost of electronic editions is much less than for printed ones, since for each new issue you need to release a separate version of a huge circulation with all the ensuing production costs, and

the electronic version of the newspaper will have only one single version, which you just need to update regularly. We must not forget the fact that paper is becoming more expensive all the time and for most editorial offices it is not economically profitable to maintain a regular paper format, especially when a serious competitor has appeared on the market – Internet publications.

As for the local press, it has changed significantly over the past ten years. As noted by M.V. Shkondin and L.L. Resnyanskaya, in 2010 city publications were one of the numerous groups of newspaper journalism in the Russian Federation. Now the situation has changed. The reason for this sharp decline is digitalization, which requires the media to implement multimedia technologies in the production of their media products. This led to the refusal of newspapers from the printed version of the publication and to the creation of an online version of the newspaper. This also means a reduction in the readership of the “paper” local press.

Traditionally, the city press is the main supplier of information for the widest circle of readers on a particular territory. As a result, it occupies a strong position in the information urban environment and it is always in demand by readers. Local and regional publications follow to the paper format so their target audience is used to consuming the information they provide. Firstly, if we turn to the data of VTsIOM, the print press is more often read by people of retirement age – 84% versus 16% of respondents aged 18 to 24. This is due, first of all, to the conservatism of older people, the complexity and unwillingness of their training with new devices, a high level of trust in the publication to which they are accustomed. Secondly, the information that is of interest to this particular audience appears most often on the pages of local print media. Basically, these various materials are about a healthy lifestyle, advice on the treatment of some diseases, advice on gardening and horticulture, household, astrological forecasts. In general, this is all that for federal and even regional publications seems not entirely relevant, because they are guided mainly by some global events in politics, economics, the world, and so on.

Considering these two conditions, we can conclude that local paper publications have developed a certain strategy of existence for themselves, guided by elderly people and existing due to their specific interests and conservative views. Consequently, it is necessary to identify a completely new specific strategy for the survival of such publications as distributors of social and informational assistance to elderly readers. Their benefits include:

1. Government support. The Russian Federation, as a socially oriented state, pursues an active social policy for all segments of the population, including the elderly. Like all people, the state needs older readers to be always involved in the information field. That is why it is very often that such media apply for government grants and subsidies and win them, since they position themselves as the only distributor of quality information for this segment of the population.

Thus, the Federal Agency for Press and Mass Communications initiated the implementation of mass events to select print media that can be provided with state support. An important condition for receiving subsidies is the recognition of a newspaper or magazine as a socially significant project that benefits different segments of the population. In 2020, 245 regional and local newspapers and magazines received state support in the field of print media for a total amount of about 160.4 million rubles; it indicates that it is important for the state to support newspapers with grants or subsidies in order to prevent their complete disappearance [8].

2. Reliance on the older people audience that due to age and capabilities will never change. Over time new technologies actively penetrate our lives – we see how electronic gadgets in schools replace books, how consumers and their tastes are actively changing. Elderly people with their conservatism and the inability of quickly adapt to these innovations leads to the idea that they will be faithful only to the media that also will not change and remain true to their ideas.

Thus, the local and regional press now represents the interests of a narrow circle of people – elderly people. It lives and functioning to satisfy their needs. To fulfill this goal more effectively it is necessary to provide a unique strategy for the development and survival of the newspaper as a social information aid to elderly readers should be implemented where suppliers of unique and quality information can be provided.

In today's world, newspaper journalism faces a hard choice. Technologies have always been and remain the main source of any changes in all spheres of life, and this process requires all participants in mass communications to change their traditions, to adapt to the new reality. Many media researchers have come to the conclusion that newspaper journalism can get a second chance if it acquires new functions, becomes convergent and trains a new generation of readers to use newspaper sources on the web, which are more reliable due to editorial technologies of fact-checking, text editing and much more. And this is exactly the strategy that many newspapers are pursuing now.

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**МЕТОДЫ СБОРА ИНФОРМАЦИИ В ЦИФРОВОЙ СРЕДЕ ДЛЯ ОРГАНИЗАЦИИ  
ИССЛЕДОВАНИЯ ПО ИСТОРИИ СТАНОВЛЕНИЯ СИСТЕМЫ ВЫСШЕГО  
ОБРАЗОВАНИЯ В СЕВАСТОПОЛЕ ПОСЛЕ ВЕЛИКОЙ ОТЕЧЕСТВЕННОЙ ВОЙНЫ  
METHODS OF COLLECTING INFORMATION ONLINE FOR THE HISTORY  
RESEARCH ABOUT FORMATION OF THE HIGHER EDUCATION SYSTEM IN  
SEVASTOPOL AFTER THE GREAT PATRIOTIC WAR**

**Аннотация.** В работе рассмотрен информационный потенциал цифровой среды для поиска источников, которые освещают роль ветеранов ВОВ в развитии севавтопольских высших учебных заведений в послевоенное время. Проанализированы возможности применения этой методики в исследовании по отечественной истории второй половины XX века. Изложены принципы, которых необходимо придерживаться при осуществлении эвристики в Интернет-пространстве. Сделан вывод, что наиболее перспективными инструментами поиска информации является эвристика в социальных сетях, персональных блогах и на официальных сайтах высших учебных заведений Севастополя. Использование методик, охарактеризованных в работе, следует осуществлять на заключительной стадии исследования, когда уже собран комплекс традиционных исторических источников по теме и выявлены пробелы в нём. Исследователю необходимо сочетать изучение традиционных исторических источников, применение методов специальных исторических дисциплин с эвристикой в цифровой среде.

**Abstract.** The paper considers the information capacity of the digital environment for sourcing the role of the Great Patriotic War veterans in the development of Sevastopol higher educational institutions in the post-war period. Capabilities, this technique provides for research on Russian history of the second half of the 20th century, are analyzed. The principles that are to be adhered to when implementing heuristics in the Internet space are stated. It is concluded that the most promising data retrieval tool is heuristics in social networks, personal blogs and official websites of Sevastopol higher education institutions. The usage of described modalities should be carried out at the final stage of the study, when the range of traditional historical sources on the topic has already been collected and gaps in it have been identified. The researcher needs to combine the study of traditional historical sources and the usage of special historical disciplines modalities and techniques with heuristics in the digital environment.

**Ключевые слова:** цифровая среда, исторические источники, севавтопольские вузы, ветераны ВОВ, методология, источниковая база, социальные сети.

**Key words:** digital environment, historical sources, Sevastopol universities, Great Patriotic War veterans, methodology, source base, social networks.

Digital environment is an integral element of the modern world. Social interaction, privacy, news, music, literature, theater and cinema: all these elements of culture have gradually penetrated the Internet space. This fact has already been understood by researchers, journalists, intelligence officers, traders, etc. [2; 3; 6; 1]. Historical research is no exception. The author makes an attempt to highlight the information capacity of the digital environment when studying the role of the Great Patriotic War participants in the development of higher educational institutions in Sevastopol after 1945. This topic did not receive special attention in historiography, which determines the novelty of the study. The relevance of the study consists, firstly, in an attempt to expand the source base of research on modern history, and secondly, in determining the role of the human factor in the formation of one of the main pillars of the Sevastopol post-war development.

At a certain stage, a historian may face the factors that impede research: gaps in archival funds, targeted destruction of documents in the past, restricted access to archives and libraries (for example, during the pandemic), secrecy of documents, fragmentation of archival funds deposited in different cities and countries. Against this background, the study of non-traditional, potential historical sources is being updated: materials from social networks, blogs, official websites of organizations, specialized thematic websites. At present, such elements of the Web 2.0 concept as Vkontakte, Odnoklassniki, LiveJournal, and YouTube can act as means for data sourcing on the problem under study. At the same time, the distribution of Internet materials by types of historical sources is controversial. A special type, in particular, is represented by digitized traditional historical sources: electronic archival documents, periodicals, photographs of museum exhibits, virtual excursions, maps, etc. The materials obtained through Internet heuristics contribute to studying various aspects of the problem, help to reveal new facts about various episodes of the veterans' activities, the achievements of their students, the peculiarities of the work of departments and administration. The data retrieved in this way supplement the information revealed through the analysis of traditional historical sources (office documentation, periodicals, museum funds, statistical materials) and through the use of methods of auxiliary historical disciplines (phaleristics, prosopography, genealogy, etc.).

During the examination of the role Great Patriotic War veterans played in the development of the Sevastopol higher education system in the second half of the 20th century, it is most expedient to use the capabilities of social networks of the domestic Internet segment (Odnoklassniki, Vkontakte), the official websites of Sevastopol universities and their predecessors [5; 7; 4].

The aim of digital environment resources usage is the expansion of the source base. The most popular digital environment – the Web 2.0 platform – is actually being created by the users themselves. The main tools provided by such online resources are adding friends, creating various interest groups, expressing your opinion on a personal online-page or blog, messaging, publishing photos, videos and text materials, etc. [8]. The researcher can find an online resource dedicated to the history of the institution under study and reveal the subscribers of this group, analyze the comments on the posts and establish contact with online-community members. At this stage, the researcher turns to the interview-technique, which is a classic tool in the framework of oral history.

Materials deposited in the Internet space have a high degree of subjectivity. They can also be edited over time. For these reasons, the methodology for studying the digital environment must be implemented at the final stage of the study, when a range of traditional historical sources has already been identified and analyzed.

Based on the abovementioned, the following conclusions are drawn:

1. It is necessary to adhere to the following set of principles in order to study online-materials effectively:

- to study the sources deposited in the digital space in an integrated manner;
- to take into account the phenomenon of a fake personal page;
- to use the materials identified on the Internet during the final phase of the study, when gaps in the range of traditional historical sources have already been identified;
- to verify data (highly subjective) retrieved from the digital environment by comparing it to the information from traditional historical sources.

2. Subject to these principles, the materials collected in the digital space contribute to the verification of information obtained from traditional types of sources, the creation of collective portraits of teachers-veterans of the Great Patriotic War, the writing of their short and detailed biographies, understanding and explanation of the psychological climate in universities, the identification of the genealogies of scientific schools, created by war veterans in the Sevastopol universities.

3. It is highly effective and promising to use the materials from the digital space in research on recent history.

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**СТАТУС РУССКОГО ЯЗЫКА И ЕГО ФУНКЦИОНИРОВАНИЕ В СФЕРЕ  
ОБРАЗОВАНИЯ В СЕВАСТОПОЛЕ В УКРАИНСКОЙ ПЕРИОД  
(1990–2010-е ГОДЫ)**

**THE STATUS OF THE RUSSIAN LANGUAGE AND ITS FUNCTIONING IN THE  
FIELD OF EDUCATION IN SEVASTOPOL DURING THE UKRAINIAN PERIOD  
(1990–2010-IES)**

**Аннотация.** В статье автор исследует вопрос статуса русского языка в Севастополе и его положение в сфере образования в украинский период. Акцент сделан на изучении источников периодической печати, нормативно-правовых актов, статистических данных. Рассмотрена языковая политика украинского государства, а также деятельность местных органов власти Севастополя. В результате исследования стало очевидно, что русскоязычное население города подвергалось нарушению своих языковых прав и предпринимало попытки защитить статус и позиции русского языка в городе. Таким образом, данная проблема позволяет сделать вывод об остром противостоянии центральной и местной власти, непризнанию украинской политики в Севастополе, что стало одним из факторов, определяющих выход Севастополя (и Крыма) из состава Украины в 2014 году.

**Abstract.** The author investigates the issue of the status of the Russian language in Sevastopol and its position in the field of education in the Ukrainian period. The emphasis is placed on the study of the periodicals, regulatory framework, statistical data. The article considers the language policy of the Ukrainian state, as well as the activities of local authorities. As a result of the study, it became obvious that the Russian-speaking population of the city was subjected to violation of their language rights and made attempts to protect the status and position of the Russian language in the city. This problem leads to a conclusion about the acute confrontation between the central and local authorities, the non-recognition of Ukrainian policy in Sevastopol, which became one of the factors determining the withdrawal of Sevastopol (and Crimea) from Ukraine in 2014.

**Ключевые слова:** русский язык в Севастополе, украинская языковая политика, статус русского языка, язык образования, преподавание на русском языке.

**Key words:** Russian language in Sevastopol, Ukrainian language policy, status of the Russian language, language of education, teaching in Russian.

At the turn of the 1990s, new trends began to manifest themselves throughout the post-Soviet space. In the conditions of the collapse of the USSR, one of the trends was the process of updating the language issue in the Union republics. In 1989, the Ukrainian language was adopted as the state language in the Ukrainian SSR and, since 1991, in independent Ukraine. Despite the general ethnic and linguistic heterogeneity within the territory of Ukraine as a whole, Sevastopol occupied a special

place, in which the majority of the population (90.6%) were Russian speaking, and the Ukrainian language was not used in the public life of the city and was not studied in schools.

The Sevastopol's cultural leaning towards Russia was accompanied by the hope of establishing Russian jurisdiction over the city following the negotiations on the Black Sea Fleet in the 1990s. Up to a certain point, this restrained the Ukrainian authorities from active "ukrainization". However, when the Treaty of Friendship, Cooperation and Partnership between the Russian Federation and Ukraine was signed in 1997, the process of ukrainization began to be traced more and more clearly. In these conditions, the city's population and local authorities faced the question of protecting the Russian language.

It is known that Sevastopol and Crimea, following the results of the referendum of 2014, turned out to be parts of the Russian state, which was largely determined by the non-acceptance of Ukrainian politics by the population of the region. Objectives: to trace the main points of the general language policy of Ukraine, the specifics of its implementation in Sevastopol, which affected the functioning of the Russian language in the city in general, and in education in particular, and to consider methods of protecting its status.

The scientific interest is studying this topic as one of the factors of the transition of Sevastopol and Crimea under the jurisdiction of Russia. The practical interest is studying the methods of the Russian language protection, which is relevant for other regions of the post-Soviet space, where a large Russian diaspora is concentrated.

The novelty consists in the use of a set of periodicals for the retrospective study of changes. The periodical press reacts most promptly to the events, which are taking place in the city, and due to the fact that the main news publications were published regularly, continuously during the period of study, it is possible to trace the situation in dynamics.

The language field of Ukraine, formed since the collapse of the USSR, did not take into account its territorial and national characteristics. According to the Law "On Languages in the Ukrainian SSR" of 1989, the state language throughout all the territory is Ukrainian, and Russian is the language of "interethnic communication of peoples", state, party, civil bodies and mass media.

The established course was formally aimed at creating favorable conditions for the functioning of the languages of national minorities and declaring the inadmissibility of "linguistic discrimination", but contradicted the actual consolidation of the Ukrainian language as the only one in court proceedings and the media. All state, regional and local acts also had to be adopted in Ukrainian with the subsequent possibility of translation into the national language "in a case of necessity".

Ukraine, on the one hand, gave its citizens "national-cultural and linguistic rights", the opportunity to adopt a language "for the whole population" in regions of compact residence of any nationality, but on the other hand did not indicate what specific status such a language could receive.

According to the All-Ukrainian Census of 2001, Russian was the native language for almost 30% of the population of Ukraine. Russians made up 71.6% (270 thousand) of Sevastopol; 90.6% of the entire city population considered Russian to be their native language. Nevertheless, according to the Deputy of the Verkhovna Rada V. Kolesnichenko, for 20 years of the existence of independent Ukraine, 6.96% of the total number of Russian-speaking schools remained in the country [1, p. 13].

Due to the specificity of the region, the Cabinet of Ministers of Ukraine approved on November 6, 1997 the "Programme for the Development and Support of Ukrainian Culture in Sevastopol, Ensuring the Functioning of the Ukrainian Language in All Spheres of Public Life of the City". This programme expressed confidence in the absence of "stable national cultural and historical traditions", set the goal of "revival and development of Ukrainian culture" through the information space to foster "a sense of national and state unity". The implementation of this programme was supported by resolutions on the procedure for using local funds allocated from the State budget for its implementation.

The Verkhovna Rada adopted the Law "On Ratification of the European Charter of Regional and Minority Languages" in 2003, which entered into force on January 1, 2006, according to which Ukraine assumed international obligations to protect the languages of national minorities. Under the



terms of the Charter, a year later Ukraine submitted a report on the status of its implementation to the Secretary General of the Council, then the Committee of Ministers of Europe approved a list of recommendations based on the results of consideration of State and Public reports in 2010. The recommendations stated the facts of violation of human rights to use the native regional language or the language of minorities in almost all spheres of society. Neither the law itself, nor the recommendations were published or distributed among representatives of language groups, which deprived the civilian society of the opportunity to defend their rights. [1, p. 26].

The Ukrainian state did not take into account the comments of European experts and continued to ignore the provisions of the Charter by state authorities. This resulted in the preparation of a Public report by the Human Rights Movement “Russian-speaking Ukraine” and the Human Rights Organization “Common Goal”, which presented a legal analysis of the actual possibilities of using regional languages and a collection of statistical data on the actual situation of minority languages in various fields, including education.

The issue of language has been relevant for Sevastopol since the beginning of the existence of independent Ukraine. Russian is spoken at a high level by the absolute majority of inhabitants of the city, and it is acceptable and comfortable for them to use Russian in all spheres of life. In 1994, the City Council decided to operate the Russian language on the territory of the city as the “official language of communication” [4].

According to the deputy of the City Council L. Litvinova, it is known that compared with 1989, the number of hours allocated for the study of the Russian language in 5-9 grades decreased from 578 to 420, the number of teachers of the Russian language has decreased from 500 to 205 over the past ten years, and Ukrainian universities have practically not trained new teachers. The chairman of the city's standing committee on culture, tourism, youth and sports V. Demchenko described this, as a process of gradual equating the Russian language with a foreign language, and Russian literature with a foreign literature [3].

After the entry into force of the European Charter of Regional and Minority Languages, the Sevastopol Local Council, referring to it and 85 thousand signatures of Sevastopol residents, almost unanimously (68 out of 70 deputies) recognized that “the Russian language in the territory of the city of Sevastopol is a regional language requiring protection and development” [2], additionally adopted “the program for the development of the regional Russian language, Russian culture in Sevastopol for 2007–2011” (and later approved a similar programme for 2012–2016).

These programmes were aimed at receiving education in Russian and to study Russian in depth at all levels of education, without damage to the teaching of the Ukrainian language as the state language. It is also aimed at providing opportunities for basic professional training and advanced training of teachers of the Russian language, ensuring the functioning of the Russian language in all spheres of public life, including city self-government bodies, mass media, verbal and written speech.

Additionally, an event plan and the amount of funding were adopted every year, due to which Russian language and culture were supported by the state budget funds of Ukraine through local authorities, a significant part of which went to education [8].

Kiev issued Order No. 461 “On approval of the sectoral programme for improving the study of the Ukrainian language in general education institutions with teaching in the language of national minorities in 2009”. Director of Gymnasium No. 1 V. Oganessian expressed the opinion that the Ministry of Education of Ukraine replaces the concepts of “learning the Ukrainian language” and “teaching in the Ukrainian language” in order to mislead the public and gradually transform the entire learning process into the state language. In the opinion of the deputy chairman of the Leninsky District Council, Russian philologist T. Ulyanova, a gradient towards teaching in Ukrainian would complicate the learning process of Russian-speaking students, because the assimilation of new information is more difficult if it is presented in a foreign language, which means they would have a less favour when they enter the university [7].

At the same time, due to the need to take an external independent assessment in the Ukrainian language in the future, the teaching of subjects in bilingual mode was introduced, which implied an increase in the number of hours per subject (for example, mathematics, geography, history) due to

the introduction of an additional hour of teaching it in Ukrainian [10]. But there were difficulties with the implementation of this methodology, due to the lack of the necessary number of teachers who speak two languages well, and therefore later it was decided to introduce only elements of bilingual education, namely, the use of Ukrainian terminology and expressions in almost all subjects of the educational cycle [9].

Of particular concern was the fact which textbooks were provided for teaching in Russian-speaking schools, and the prohibition on the use of Russian books. Although the practice of compiling them for other national minorities of Ukraine in connection with representatives of third-party states was present.

In May 2009, at the initiative of the Moscow Department of Education, the VIII international meeting “Models and experience of the development of Russian-language education in a foreign school” was held in Sevastopol, where the deputy of the Leninsky District Council O. Timofeeva convinced not to wait for a “miraculous” solution to all problems, but to require Ukraine to return to the legal field in the sphere of education for ensuring constitutional rights [5]. There also was an attempt to approve a social contract that was supposed to secure the right to study in the native language.

On July 3, 2012, the Verkhovna Rada of Ukraine adopted the Law “On the Basics of State Language Policy No. 5029-VI”, which was positively reacted to in the Sevastopol City Council, but it was noted that this law could have “unpredictable negative consequences” because it contradicts the Constitution of Ukraine and the current Law “On Languages”.

Before its approval, the conference “Russian language – the language of interethnic communication” was held in Sevastopol On March 23-24. On this conference deputies G. Basov, D. Belik, E. Dubovik proposed to prevent “the status of the Russian language from being reduced to the level of the language of national minorities”, and “in the name of civil peace in Ukrainian society ... to give the Russian language the status of the second state language”. They wanted approving the principle of equal accessibility of Ukrainian and Russian as the language of science, education, law, ideology and morality” [6].

Thus, it can be seen that the issue of the functioning of the language in a country with another state language, first of all, comes across the legislative framework of this state, and therefore local initiatives should represent a unified strategy in order to effectively influence public policy.

For success, it is necessary to support the forces of public diplomacy: in the Russian Federation, such structures as the “Russkiy Mir” Foundation, which actively operated in Sevastopol on the basis of the Lazarev Marine Library, as well as Rossotrudnichestvo, can be considered its instruments.

They help to found the Ukrainian public organization “Russian School” in the city in 2007, which held events and competitions aimed at popularizing Russian literature, held forums and conferences where representatives of various organizations and school teachers discussed Russian language teaching problems in Ukraine and exchanged experience. In October 2011, Russian Schools International Association was established, with the aim of “establishing communication with colleagues from near and far abroad in the transfer of teaching experience in Russian”.

The data of the periodical press demonstrate that the issue of language teaching in Sevastopol schools was relevant throughout the period under review. It is possible to distinguish periods of escalation of language conflicts caused by Kiev's policy, and, on the contrary, periods of calm when both sides accepted the status quo.

The policy of Ukrainization, together with the general humanitarian policy of Ukraine, largely contradicted the interests of the predominantly Russian Sevastopol. Russian language teaching hours were reduced, the number of schools and classes with teaching in Russian was reduced, the scope of the use of the Russian language in the information space was reduced, which affected the quality of life of Sevastopol residents. A particular concern in the city was caused by the coming to power of radical leaders in Kiev in February 2014, which was the reason for solving the situation in the political dimension.

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## АНАЛИЗ УПОТРЕБЛЕНИЯ АНАФОРЫ В ПОЛИТИЧЕСКОМ ДИСКУРСЕ THE ANALYSIS OF THE USE OF ANAPHORA IN POLITICAL DISCOURSE

**Аннотация.** В статье рассматривается проблема использования анафоры в политическом дискурсе. Целью статьи является анализ образцов использования анафоры в политических речах, его коннотаций, значения и успешности. В качестве примеров были взяты речи известных политиков прошлого и современности: Уинстона Черчилля, Мартина Лютера Кинга, Барака Обамы, Эда Милибэнда и Дэвида Кэмерона. Статья направлена на студентов языковых специальностей, а также на всех, интересующихся политическим дискурсом и использованием в нём средств выразительности.

**Abstract.** The article deals with the problem of the use of anaphora in political discourse. The purpose of the article is to analyze samples of the use of anaphora in political speeches, its connotations, meaning and success. The examples were taken from the speeches of various prominent politicians of the past and present times: Winston Churchill, Martin Luther King Jr, Barack Obama, Ed Miliband and David Cameron. The article will be useful for linguistics students as well as anyone interested in political discourse and the associated use of means of expression.

**Ключевые слова:** анафора, политика, политический дискурс, речь, средства выразительности, значение, риторика.

**Key words:** anaphora, politics, political discourse, speech, means of expression, meaning, rhetoric.

Anaphora is a repetition of a word or expression at the beginning of successive phrases, clauses, sentences, or verses especially for rhetorical or poetic effect [1]. The term originated from the Greek ἀναφορά (anaphora), meaning “to bring back” or “to carry back”. It is commonly used in poetry in order to emphasize key words or ideas. Another area in which anaphora is utilized is rhetoric, the art of effective or persuasive speaking or writing, therefore it’s quite helpful in the field of politics. The main goal of political discourse is to gain people's trust and rhetoric ensures success in that aim.

Other than the function of emphasizing ideas, the use of anaphora as a rhetorical device adds rhythm to a word as well as making it more pleasurable to read and easier to remember. Anaphora serves the purpose of delivering an artistic effect to a passage. It is also used to appeal to the emotions of the audience in order to persuade, inspire, motivate and encourage them. Using anaphora can heighten audience involvement by playing with expectations, and occasionally subverting them. Such a pattern of repetition at the beginning of phrases or sentences is particularly useful in political speech and writing as a means of engaging an audience. Anaphora holds their attention, and creates a lasting impression. Done well, anaphora can stir and intensify an audience’s emotions as the repeated elements build towards an unforgettable climax.

However, there are limits to the capabilities of anaphora. In fact, it may become detrimental to the speech if used by an incompetent speaker. Anaphora, like any rhetorical device, can be overused. Speakers should limit the number of times a word or phrase is used in a single anaphora. For most speeches and presentations, three is an ideal number. Beyond three, a speaker risks sounding affected, theatrical or bombastic.

One of the most well-known and widely successful uses of anaphora in modern political discourse was the “We shall fight on the beaches” speech by the British Prime Minister Winston Churchill. It was delivered to the House of Commons of the Parliament of the United Kingdom amidst World War II on 4 June 1940. This was the second of three major speeches given around the period of the Battle of France. In this speech, Churchill had to describe a great military disaster, and warn of a possible invasion attempt by Nazi Germany, without casting doubt on eventual victory. He also had to prepare his domestic audience for France's falling out of the war without in any way releasing France to do so, and wished to reiterate a policy and an aim unchanged – despite the intervening events – from his speech of 13 May, in which he had declared the goal of “victory, however long and hard the road may be” [4]. One of the most recognizable and memorable parts of the speech is the use of the anaphora, which was so effective that it became the common name for the speech. The abstract is as follows:

*“We shall go on to the end, we shall fight in France, we shall fight on the seas and oceans, we shall fight with growing confidence and growing strength in the air, we shall defend our island, whatever the cost may be. We shall fight on the beaches, we shall fight on the landing grounds, we shall fight in the fields and in the streets, we shall fight in the hills; we shall never surrender ...”*

Churchill's famous speech is quite long, but he uses anaphora only once. This makes its poetry and imagery sparkle against the backdrop of the rest of the speech, which was written in a conversational prose style. The unique historical significance of Churchill's speech also played a big part in its success. It was delivered at a pivotal moment when Britain was facing up to the appalling possibility of the invasion of its territory by Nazi Germany. Churchill's anaphora acknowledges the threat and responds to it with defiance. The anaphoric repetition embodies Churchill's message of resistance and determination. He built his anaphora around a series of evocative Old English words: *beaches, landing grounds, fields, streets, hills, and island* [3]. This helped him connect with his audience, who related greatly to these words. The speech was immediately recognized to be historic. Jock Colville, one of Churchill's secretaries, noted in his diary "A magnificent oration, which obviously moved the House". Chips Channon, a Conservative MP, wrote in his diary "he was eloquent and oratorical and used magnificent English; several Labour members cried" [4]. Extracts of the speech were later read by the newsreader on that evening's BBC news broadcast. They made a great impression on the general population of England, whose spirits had been low for a long time.

Another speech commonly brought up when talking about anaphora in political discourse is commonly called the "I have a dream" speech that was delivered by American civil rights activist and Baptist minister, Martin Luther King Jr., during the March on Washington for Jobs and Freedom. The March on Washington for Jobs and Freedom, also known as simply the March on Washington or The Great March on Washington, was held in Washington, D.C., on Wednesday, August 28, 1963. The purpose of the march was to advocate for the civil and economic rights of African Americans. Delivered to over 250,000 civil rights supporters from the steps of the Lincoln Memorial, the speech was a defining moment of the civil rights movement and among the most iconic speeches in American history. King originally designed his speech as an homage to Abraham Lincoln's Gettysburg Address, timed to correspond with the centennial of the Emancipation Proclamation.

The March on Washington Speech, known as "I Have a Dream" Speech, has had several versions, written at several different times. It has no single version draft, but is a combination of several drafts, and was originally called "Normalcy, Never Again". Little of this, and another "Normalcy Speech", ended up in the final draft. The focus on "I have a dream" comes through the speech's delivery. Toward the end of its delivery, noted African-American gospel singer Mahalia Jackson shouted to King from the crowd, "Tell them about the dream, Martin." King departed from his prepared remarks and started "preaching" improvisationally, punctuating his points with "I have a dream" [2]. Once again, the part of the proclamation that employed the use of anaphora turned out to be the most memorable and gave the name to the speech. The abstract containing the famous anaphora is as follows:

*"I have a dream* that one day this nation will rise up and live out the true meaning of its creed: 'We hold these truths to be self-evident: that all men are created equal.'" *I have a dream* that one day on the red hills of Georgia the sons of former slaves and the sons of former slave owners will be able to sit down together at the table of brotherhood. *I have a dream* that one day even the state of Mississippi, a state sweltering with the heat of injustice, sweltering with the heat of oppression, will be transformed into an oasis of freedom and justice. *I have a dream* that my four little children will one day live in a nation where they will not be judged by the color of their skin but by the content of their character. *I have a dream* today."

Although anaphora had been used throughout the speech, the most widely cited example of anaphora is found in the often-quoted phrase "I have a dream", which is repeated eight times as King paints a picture of an integrated and unified America for his audience. Early in his speech, King urges his audience to seize the moment; "Now is the time" is repeated three times in the sixth paragraph. Other occasions include "One hundred years later", "We can never be satisfied", "With this faith", "Let freedom ring", and "free at last" [2]. However, none of them were as impactful as the former. King used the "I have a dream" anaphora to highlight the difference between how things are and how he hopes they will be. Notably, King utilized anaphora to add finesse and structure to the piece. For example, his position is made clear when he repeats "We can never be satisfied." Each time this line is stated, it precedes a complaint about how society mistreats black people. In essence, it catalogues

his ideas for the reform that he demands to occur in America. Undoubtedly, it was the undeniably skillful placement and use of rhetorical devices that made his speech so influential.

Discussions of anaphora never fail to return to Churchill's "We shall fight on the beaches" and Martin Luther King's "I have a dream" speeches; and rightly so, as both represent the gold standard of anaphora in modern oratory. However, many other political figures have used this rhetorical device over the years, with varying degrees of success. One of them is Barack Obama and his "Yes, we can" speech after his first victory in the elections in 2008, on the 8-th of January. He used anaphora and epistrophe many times throughout this discourse and the particularly prominent repetition of his slogan once again became the most memorable fragment and the common name for the speech. The phrase "Yes, we can" was used six times and carried a positive and hopeful message, a desire for change and for a better future. Another example of anaphora in the speech has a similar connotation:

*"This is our chance to answer that call. This is our moment. This is our time."*

It was in large part thanks to successful rhetoric that the speech became so widely known and successful. It cast a hopeful light on Barack Obama's future presidency and united the people. The reception of the speech was quite favorable with numerous news sources and critics comparing it to Martin Luther King's "I have a dream" for its success and skillful rhetoric. Barack Obama proceeded to deliver many more speeches frequently using anaphora which were received decently.

However, it would be a fallacy to state that every speech using anaphora was as successful and historic as the ones discussed above. Many present-day politicians have a tendency to blunt anaphora's impact by employing it incontinently throughout a speech. For example, Ed Miliband and his 2014 conference speech. Edward Samuel Miliband is a British politician who was Leader of the Labour Party and Leader of the Opposition at the time of the declamation. The following extract is from the speech mentioned above and the overuse of anaphora is clearly visible:

*"An idea rooted in this party's character and our country's history. An idea that built our greatest institutions and got us through our darkest moments. An idea that is just one simple word. Together. Together. Together we can restore faith in the future. Together we can build a better future for the working people of Britain. Together we can rebuild Britain. Friends, together we can."*

One of the main flaws of this speech is the lack of meaning in the use of anaphora. Unlike Churchill's or King's, Miliband's discourse didn't have any unique historical significance. The expressiveness of the anaphora ended up practically wasted because the situation didn't call for it. Moreover, the speech lacks originality. His choice of Old English words – together, root and darkest – evokes Churchill's "We shall fight on the beaches" anaphora and his equally famous "Finest hour" speech. On the other hand, Miliband's "together we can" anaphora calls to mind the celebrated "yes, we can" anaphora from Barack Obama's 2008 election victory speech [3]. But most of all, not enough thought was put into this borrowing and the two didn't combine in a meaningful and complementary way, resulting in an unmemorable and dull discourse. The abstract Latinate coldness of "idea" has a chilling effect on the Old English warmth of "together"; and they end up cancelling each other out in a meaningless act of union [3].

Another example of an unsuccessful use of anaphora is David Cameron's 2013 conference speech. David William Donald Cameron is a British politician who served as Prime Minister of the United Kingdom and Leader of the Conservative Party at the time of the declamation. The extract from the speech mentioned above is as follows:

*"When the world wanted rights, who wrote Magna Carta? When they wanted representation, who built the first parliament? When they looked for compassion, who led the abolition of slavery? When they searched for equality, who gave women the vote? When their freedom was in peril, who offered blood, toil, tears and sweat? And today – whose music do they dance to? Whose universities do they flock to? Whose football league do they watch? Whose example of tolerance of people living together from every nation, every religion, young and old, straight and gay? Whose example do they aspire to?"*

This speech contains a lot of the same problems as the one discussed prior. The use of anaphora in the given situation is uncalled for in the first place, especially in such quantity. Moreover,

it refers to the events and achievements of the past and mentions Churchill's famous "blood, toil, tears and sweat" phrase without adding anything original. However, the main flaw of this speech is how dull and unexpressive the anaphora itself is. It consists of a single word, which doesn't have any connotation or meaning of its own, reducing its expressiveness and rhythmic power to nothing.

Anaphora can be a useful tool in political discourse and many competent politicians used it to affect and inspire millions. However, in the hands of an amateur it becomes little more than white noise. Anaphora should be treated with respect. Used well, and sparingly, its impact on an audience can be profound and long-lasting. Used carelessly, it falls flat and fails completely to produce the intended effect.

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**ГРЕЧЕСКОЕ ВЛИЯНИЕ НА ИЗМЕНЕНИЕ ТЕРМИНА *СЛОВО* В  
ГРАММАТИЧЕСКИХ ТЕКСТАХ ДОЛОМОНОСОВСКОГО ПЕРИОДА  
GREEK INFLUENCE ON THE CHANGE OF THE TERM WORD IN GRAMMATICAL  
TEXTS OF PRE-LOMONOSOV'S PERIOD**

**Аннотация.** Термин «слово» является одним из центральных понятий в лингвистической науке. Оно менялось на протяжении веков, начиная с античности: в разное время составители грамматик давали ему свои трактовки, и новые заметно отличались от предыдущих. Итак, исследование посвящено описанию того, как изменялось значение термина «слово» в русских грамматических текстах под влиянием греческой традиции. Демонстрируется, что в грамматиках допетровской эпохи термин «слово» отражается в таких понятиях, как Логос (монументальное понятие древнегреческой философии), Лексис, фразис, глагол и речение. Материалами для исследования послужили грамматические тексты, переведенные на славянский язык с греческого: от И. Дамаскина до Мелетия Смотрицкого. В качестве источника была использована монография Игнатия Викентьевича Ягича. Полученные результаты позволяют значительно уточнить важные аспекты формирования отечественной лингвистической терминологии.

**Abstract.** The term 'WORD' is one of the central concepts of linguistic science. It has changed over the centuries: at different times, the compilers of grammars gave it their own interpretations, and the new ones were noticeably different from the previous ones. So, the study is devoted to describing how the meaning of the term 'WORD' in the Russian grammatical texts changed under the influence of the Greek tradition. It is demonstrated that in the grammars of the pre-Peter era, the term 'WORD' is reflected in such concepts as LOGOS (a monumental concept of the ancient Greek philosophy), LEXIS, PHRASIS, VERB and UTTERANCE. The materials for the study were grammatical texts translated into Slavic from Greek: from I. Damaskin to Meletiy Smotrytsky. The monograph of Ignatius Vikentievich Yagich was used as a source. The results obtained make it possible to significantly clarify important aspects of the formation of the Russian linguistic terminology.

**Ключевые слова:** слово, логос, лексис, греческая традиция, славянская традиция, доломоносовская эпоха.

**Key words:** word, logos, lexis, Greek tradition, Slavic tradition, pre-Lomonosov's era.



The relevance of this work is determined by the place occupied by the term ‘WORD’ and the concept designated by it in the linguistic picture of the world.

The aim of this research is to construct a chronology of the change in the concept of the word in the Slavic tradition under the influence of the Greek canon in translated and original grammatical texts from John Damascene to Meletius Smotrytsky.

The concepts of LOGOS and LEXIS had changed a lot before they entered the field of grammar. In the works of ancient Greek philosophers the LOGOS was interpreted as a “word about existence” by the representatives of the Elean school; as a “concept as the content of a word”, as a rational “word” by Socrates; as an idea, an objective thought by Plato; as an objective concept of a thing, and combination of its causes and forms by Aristotle. In the grammatical works of Plato, Aristotle and Thracian LOGOS meant speech, sentence. And Thracian’s LOGOS is divided into 8 parts of speech.

In the philosophy of Confucianism, the ‘WORD’, the LOGOS, is understood as a magical tool of the universe. In Christian teaching (as it was established by referring to the “Mysalogy” by Maxim the Confessor) – as the essence, the unity of all things.

John Damascene (C. 675 G., Damascus – approx. 753, Lavra of St. Sabbas the Sanctified) made a significant contribution to the development of culture and the formation of philosophical and grammatical concepts. In “The Source of Knowledge” he describes the concepts of the ‘WORD’ (λέξις) and LOGOS (λόγος): “And the name, although it often expresses the nature of things, is not a definition, because the name is one WORD (λέξις), and the definition is SPEECH (λόγος), and it is composed at least of two different words” [1, p. 66].

In the text of Friar Khrabr “About the writings by Friar Khrabr” we find the concept of UTTERANCE (φράσις). It may be assumed that the form UTTERANCE was used by Khrabr in the meaning of “a phrase, a finished thought”, or even ‘WORD’. The term UTTERANCE will later become firmly established in the grammatical terminology of the pre-Lomonosov’s period.

A description of the eight parts of the word is given in the text “About the eight parts of the word”, dating from the tenth century and attributed to I. Damascene. It is divided into: “имѣ, рѣчѣ, причестіе, разлчїе, мѣсто-именѣ, прѣдлогѣ, нарѣчїе, союзѣ” (“name, verb, participle, interjection, pronoun, preposition, adverb, conjunction”) [3, p. 329]. The listed concepts are nothing but parts of speech. This suggests that the ‘WORD’ here is the same as speech in the understanding of the «part of speech». It is noteworthy that in the original Greek it is written as ΛΟΓΟΣ, and an unknown scribe translated it exactly as ‘WORD’. This gives an idea of the word as speech in the concept of a part of speech – and this point of view was widespread until Lomonosov’s “Grammar”.

In the “Grammar of letters” by Constantine the Philosopher (1380, Kostenets – 1431, Belgrade), the verb has all the characteristics of the word: “и ѿблѣаетъ ебѣн глѣ събръзшєнъ въ двѣ ѿ ѿнѣ трѣхъ писмени и҃це, ѿко еѣ трѣхъ глѣ” (“and the perfect verb consists of two or three letters, for example, I’m telling you”) [3, p. 428]. Constantine notes that “глѣ събръзшєнъ” (“the perfect verb”) – expresses a complete, perfect thought and appears in two or three letters. A word is graphically composed of letters. The text also contains the form LEX (λέξις), which refers to the works of Thracian and Damascene.

Maxim the Greek supplemented the teaching “About the eight parts of the word” by adding the term UTTERANCE there, understood as word, and ‘WORD’ understood as sentence.

“The Grammatika of the well-spoken Greek-Slavic Language” by the collective authorship of Adelfotes, published in 1591 in Lviv – is a parallel presentation of grammar in Greek and Slavic languages. “Речєніє єсть чѣсть малѣа изчїнїтєльнаго слѣва раздѣлѣтєльнаа. Слово єсть речєніѣн слѣжєніє, мѣсль самосѣбєршєнѣ ѿблѣающєє” (“Utterance is the part into which the word is divided. A word is a sum of utterances that conveys a complete thought”) [1, p. 9]. The terminology there becomes even more stable: the word which in the Greek version understood as Logos, means speech (as parts of speech), and speech (λέξις) is viewed as a modern word.

Anonymous texts only strengthen this tendency. And the grammars of Laurentius Zizaniy and Meletius Smotrytsky complete the process of formation of the terminology of pre-Lomonosov's period, which is characterized by the influence of the Greek language. However, at that stage, the changes in the terminological definition of the term 'WORD' did not stop: after Lomonosov's "Grammar", the concepts were revised under the influence of a new tradition.

After having considered all the works, we can say that the Greek terminological tradition influenced the Slavic one. It is important to note that this applies only to pre-Lomonosov's period.

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## **КОНЦЕПТ «ЖЕНЩИНА» ВО ФРАНЦУЗСКОМ СЛОВАРЕ ЗОНЫ THE CONCEPT OF "WOMAN" IN THE FRENCH DICTIONARY OF THE ZONE**

**Аннотация.** В данной статье автором предпринята попытка рассмотреть концепт «женщина», который находит свое отражение в языке разных слоев французского общества наших дней. За исследовательскую основу и эмпирическую базу взят материал французского словаря «Зона», представляющий собой собрание сленговых и арготических форм языковых единиц, используемых в пригородных районах Парижа. Анализ подверглись различные лексические единицы, в основном имена существительные и прилагательные, которые связаны с понятием «женщина», а также акцентируется внимание на способах образования данных словоформ, приводятся соответствующие примеры и к ним даются комментарии. На основании изученных новых слов и словосочетаний, автор делает вывод о понимании образа «женщина» представителями современного поколения французов – жителей пригородной парижской «зоны».

**Abstract.** In this article, the author attempts to consider the concept of "woman", which is reflected in the language of different strata of French society today. The research basis and empirical base are based on the material of the French dictionary "Zone", which is a collection of slang and argotic forms of language units used in suburban areas of Paris. Various lexical units have been analyzed, mainly nouns and adjectives that are associated with the concept of "woman", and attention is also focused on the ways of forming these word forms, there are appropriate examples and comments given. Based on the studied new words and phrases, the author makes a conclusion of understanding the image of "woman" by the representatives of the modern generation of Frenchmen – residents of the suburban Parisian "zone".

**Ключевые слова:** концепт, женщина, словарь зоны, верлан, апокопа

**Key words:** concept, woman, zone dictionary, verlan, apocopa

À l'heure actuelle, le mouvement du "féminisme" gagne constamment de l'ampleur dans tous les domaines de la vie de la société et a une grande popularité. Les partisans de cette manifestation du principe féminin dans tout le monde se battent pour l'élargissement des droits économiques, politiques, personnels et sociaux pour le beau sexe. Ces changements, les exigences, la démonstration généralisée de l'attitude à l'égard de l'égalité des sexes concernent également le domaine de la linguistique, comme en témoigne la linguistique féministe, qui vise à exposer et à surmonter la domination masculine dans la langue [1].

La question de la féminisation des mots désignant les professions, le type d'activité, les titres en français est particulièrement aiguë, ce qui est le but des études présentées maintenant et ultérieures. Dans ce contexte, il est d'abord important de comprendre quelle est l'interprétation du concept de

“femme” dans sa reproduction académique dans les différents dictionnaires des unités lexicales de la langue française. Cette étude portera sur le dictionnaire de français de la Zone [6].

Dans le cadre de l'étude du concept de “femme” dans les différents dictionnaires de la langue française, ce sont le *Dictionnaire de l'Académie Française* et *Larousse* [4; 5], notre attention est également tombée sur un dictionnaire français de la Zone (ou bien *Tout l'argot des banlieues – le dictionnaire de la Zone en 2600 définitions*). La zone, autrefois, espace militaire qui s'étendait au-delà des anciennes fortifications de Paris, occupé illégalement par des constructions légères et misérables ; aujourd'hui, espace à la limite d'une ville, caractérisé par la misère de son habitat [5]. Autrement dit, il s'agit d'un bidonville de banlieue, plus peuplé de migrants, où le niveau de vie est nettement inférieur à celui de la ville elle-même. La langue de ce dictionnaire est composée d'argot, de verlan et de divers dialectes. Il présente également, en plus des définitions, des exemples avec les mots provenant de diverses sources: du rap français, du cinéma, de la radio, ainsi que de la vie quotidienne pour lister les mots les plus couramment utilisés dans les banlieues.

Le dictionnaire contient 2600 définitions, dont 54 termes signifient des concepts tels que “femme, fille”. Au cours des travaux, il est apparu que tous les mots de cette catégorie peuvent être divisés en plusieurs groupes, en fonction de l'attitude envers les femmes, lors de l'utilisation de ces mots aux sens négatif / péjoratif, positif et neutre.

On a vite découvert que les mots avec une signification négative étaient les plus importants. Ainsi, la signification la plus courante dans ce groupe était “une femme facile, une femme méprisée”. Sur la base de ces informations, on peut affirmer que, en général, l'image d'une femme dans ce dictionnaire a une couleur négative. Cela est peut-être dû au fait que les femmes qui se prostituent viennent le plus souvent de zones défavorisées et, comme règle, à des difficultés financières. Exemples de mots: crasseuse – fille ou femme à la réputation d'une fille facile, substantivation de crasseux “couvert de crasse” avec ici, un sens figure; grognasse – femme plus ou moins méprisable, de grogner avec le suffixe féminin péjoratif – asse; gueuse – femme débauchée, prostituée, probablement emprunté au mot néerlandais *guit* “coquin, fripon” “femme”, qui donne régulièrement *goue* en français.

D'autre part, il y a aussi ces définitions qui condamnent la beauté des femmes. Par exemple, bastos – femme très belle, analogie entre l'effet produit par le tir d'une balle d'arme à feu et la beauté d'une belle femme; bombe – fille, femme très belle. Bien qu'il y ait ses propres caractéristiques. Ainsi, le mot *colis* a été utilisé comme euphémisme, à l'origine désignait une prostituée novice envoyée par son souteneur à une “maison”. Un autre mot *bonne* signifie aussi “belle, jolie femme”, avec une extension de la signification de l'adjectif “bonne” appliqué à une femme dans le sens de agréable, donnant satisfaction et plaisir”.

Le groupe suivant est les mots neutres, c'est-à-dire sans contexte, il est impossible de comprendre pourquoi l'auteur a choisi d'utiliser ce mot et ce qu'il voulait dire. Ce groupe comprend les mots suivants: feum, feumeu, frangine, gonze qui signifient femme, fille.

Je tiens également à noter la variété des façons de former des mots. Dans les mots, vous pouvez trouver les méthodes suivantes: *verlan*, *apocopa*, *aphérèse*, *suffixation*.

Le verlan est une forme d'argot français qui consiste en l'inversion des syllabes d'un mot, parfois accompagnée d' “élision”, un type d'apocope. C'est en inversant les syllabes de la locution adverbiale (à) l'envers que le terme de verlan a été créé. On parle de formes verlanisées pour caractériser les vocables du verlan [8]. Le verlan est un argot de jeunesse français. Initialement utilisé par la classe ouvrière et les immigrants vivant à la périphérie de Paris. Par la suite, il s'étend rapidement à toutes les couches de la société grâce à son utilisation dans le cinéma et la musique. Par exemple, dans le dictionnaire, vous pouvez trouver les mots suivants: bebon – une très belle fille ou une femme (verlan de bombe), cegar – une fille désagréable, sans morale (verlan de garce (chienne)).

Une apocope, du grec *apokoptein/ἀποκόπτειν* (“retrancher”), est une modification phonétique, parfois utilisée comme figure de style, qui se caractérise par l'abréviation du mot complet, en gardant uniquement son ou ses premiers phonèmes ou syllabes (vocaliques ou consonantiques), par exemple “auto” pour “automobile” [3]. Par exemple, feum est une femme, une fille, un apocope de feumeu; pouf nom féminin – femme vulgaire, apocopa de poufiass

En linguistique, l'aphérèse (du grec ancien: ἀφαίρεσις *aphaíresis*, "ablation") est une modification phonétique impliquant la perte d'un ou plusieurs phonèmes au début d'un mot. L'aphérèse est un métaplasme s'opposant à l'apocope [2]. Par exemple, loute est une fille, une jeune femme. Aphérèse du mot louloute "fille", une forme du genre féminin du mot lolou "bandit".

Souvent, les mots ont été formés simplement de manière suffixée, les suffixes les plus courants sont: -ette, par exemple, dans le mot gorette et le suffixe péjoratif -asse, comme dans bouffiasse.

En outre, il est possible de distinguer les mots formés à partir de mots empruntés à d'autres langues. Par exemple, fatma est une femme, instruite du nom arabe Fatima, fatou est une fille noire originaire d'Afrique, instruite du nom africain fatoumata. Ces emprunts sont dus au fait que des travailleurs étrangers bon marché ont été recrutés pour construire de nouvelles maisons dans la zone (Espagne, Italie, Maghreb et Afrique) et que, lorsque les premiers habitants ont emménagé dans de nouvelles maisons, les places libres laissées dans les blocs ont été mises à la disposition des travailleurs immigrés, qui y ont ensuite amené leur famille de leur pays d'origine. Ces personnes, en raison de leurs origines ethniques, culturelles et religieuses différentes, étaient plus ou moins bien intégrées dans la société française, mais la crise économique qui a commencé après le premier choc pétrolier leur a laissé peu de chances de migrer vers des résidences, comme l'ont fait leurs prédécesseurs [7]. Par conséquent, la plupart des habitants des zones sont des personnes qui ont émigré d'autres pays.

Il est également intéressant de noter qu'un certain nombre de mots ont été associés à des termes animaux, dont la signification est le plus souvent péjorative.

Exemples de mots:

1. Belett, nom féminin. Fille, jeune femme. Syn. caille. étym. Terme animalier pour désigner la femme.
2. Caille, nom féminin. 1. Fille, femme. Syn. belette. 2. Chose de peu de valeur. 3. Jeune voyou. étym. 1. Emploi dépréciatif ou hypocoristique du nom du volatile. – 2. Aphérèse de quincaille. – 3. Apocope Suppression de syllabe(s) à la fin d'un mot. de caillera.
3. Chiennasse, nom féminin. péjoratif. Femme facile, portée sur le sexe et pour laquelle on n'a peu d'estime. étym. Du nom chien au féminin avec le suffixe péjoratif -asse.
4. Poulette, nom féminin. Jeune femme. étym. Suffixation en -ette de poule.
5. Salope, nom féminin. 1. injure. Femme dévergondée, de mauvaise vie, garce. 2. Fille facile. 3. injure. Individu peu recommandable, abject. Verlan lopesa. étym. Terme formé à partir des mots sale et hoppe, forme lorraine du mot huppe, oiseau possédant une tête avec une touffe de plume et réputé pour être négligé du fait de l'odeur pestilentielle de son nid.
6. Rate, nom féminin. Femme, fille. Syn. gonzesse, meuf, nana, racli. étym. Terme emprunté au langage animalier rate "femelle du rat".

Selon les résultats des travaux de recherche, on peut constater que le concept de "femme" dans le dictionnaire français de la Zone a avant tout une caractéristique négative, car la plupart des significations liées aux concepts de "femme, fille" étaient associées au sens de "femme publique et méprisée", malgré le fait qu'il y avait aussi des définitions qui condamnent la beauté du sexe magnifique.

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**ФЕМИНИТИВЫ В РУССКОМ И АНГЛИЙСКОМ ЯЗЫКАХ  
КАК СПОСОБ ИЗМЕНЕНИЯ ОБЩЕСТВА:  
ЯЗЫК КАК ИНДИКАТОР ОБЩЕСТВЕННЫХ ИЗМЕНЕНИЙ  
FEMINITIVES IN RUSSIAN AND ENGLISH AS A WAY TO CHANGE SOCIETY:  
LANGUAGE AS AN INDICATOR OF SOCIAL CHANGE**

**Аннотация.** В статье рассматривается специфика образования и употребления феминитивов в английском и русском языках. Раскрывается роль феминитивов с точки зрения гендерной лингвистики (в частности, феминистской критики языка). Затрагивается вопрос о влиянии языковой политики политкорректности, проводимой в США с целью избегания проявлений дискриминации и словесных оскорблений, на языковые изменения в русском языке. Приводятся результаты лингвосоциологического исследования, свидетельствующие о готовности студентов, изучающих иностранный язык в качестве основной специальности, поддержать использование феминитивов как инструмента изменения отношения к женщинам в обществе.

**Abstract.** The article discusses the specifics of the formation and use of feminines in English and Russian. The role of feminines from the point of view of study of language and gender (in particular, feminist criticism of language) is revealed. The article touches upon the influence of the language policy of political correctness, which took place in the United States in order to avoid discrimination and verbal insults, on language changes in the Russian language. The results of a linguosociological study are presented, according to which students studying a foreign language as their main specialty are ready to support the usage of feminines as a tool for changing attitudes towards women in society.

**Ключевые слова:** феминитив, язык, лингвистика, пол, гендер, феминизм.

**Key words:** feminine, language, linguistics, sex, gender, feminism.

Nowadays, the language is increasingly becoming the subject of political disputes. This is especially true of the gender sphere of language. In the modern Russian language, the interest towards feminines has come to life again, and many political activists, cultural figures, and even people of science are trying to make them an integral part of the modern Russian language. The important question remains whether the change of the Russian language, by turning it into a more inclusive language, will affect the status of women in society. As well as how society as a whole thinks of the initiative of introducing new feminines into the Russian language.

It's well known that any language is a living thing, because it is constantly developing. And of course the Russian language isn't an exception. But Russian isn't developing in a vacuum; other languages are having an impact on it even now. And, perhaps, the most influential language is English.

In modern English gender question is extremely relevant. First, feminines were started to become more and more popular and used in the English language because of the women's rights movements in the mid-twentieth century. They can be considered as a part of the politically correct agenda, which began to gain momentum in the second half of the XX century in the United States. It, political correctness, was a tool to combat the hate speech as well as a way of representing certain groups of the population in the language [3].

Below the most used tools of forming feminines in English are displayed [4, p. 78; 8]:

- |                            |                               |
|----------------------------|-------------------------------|
| – waiter – waitress;       | – teacher – lady teacher;     |
| – landgrave – landgravine; | – sculptor – female sculptor; |
| – major – majorette;       | – doctor – woman doctor;      |
| – dancer – danseuse;       | – he – he or she.             |
| – policeman – policewoman; |                               |

Separately, we can highlight the debate concerning the word “woman”, which has been going on for more than a century. Some feminist movements believe that this word is disparaging towards women. At the beginning of the twentieth century, “wimmin” was proposed as the first alternative to the traditional “woman”. During the second wave of feminism, the 1970s, such variations as “wombyn” and “womyn” became widespread. The latter is popular in feminist circles to this day. However, in the 10th of the XXI century, against the background of an active struggle for the rights of transwomen, a variant “womxn” was proposed, which should become more inclusive [10].

Because of all these changes in English new branches of language science appeared. The study of language and gender (or “гендерная лингвистика” in Russian) was one of them. Linguists, who were linked with it, tried to discover how society influences language, especially in the field of gender relationships (male and female vocabulary, description of men and women, gender aspect in word formation and so on).

The work “Language and the place of women”, written by R. Lakoff in 1975, is the first fundamental work in which the justification of androcentrism of language is given, as well as a detailed description of the aforementioned sexism towards women is given [4, p. 76]. In English, as in many other European languages, masculine forms are preferred to denote speakers of any gender

or a group of persons consisting of representatives of different genders. The most striking example of such androcentrism is the identification of the concept of “man” and “male”. After all, language reflects all the phenomena occurring in society, including the social hierarchy. From the standpoint of feminist criticism, the English language contains a powerful tool for preserving patriarchal values, entrenching sexism. The presence of sexism in language leads to the alienation of women from full rights in society. Since childhood, they are forced to see things from a male point of view. Against this background, many representatives of feminist criticism of the language began to characterize the English language as “manmade”. D. Spender, author of another fundamental work “Man Made Language”, also notes that the objectification of women is pronounced in the English language, and many traditional lexemes (associated with women) have become perceived as stereotypical and negatively colored [4, p. 76]. She stressed that language is not adequate for the presence of women in society, it reflects the male picture of the world, giving women a secondary role. As a consequence, the dominant position of men in the world is seen as natural. Also, D. Spender notes that the traditional English language has a large number of words intended to describe men. At the same time, they carry a negative connotation much less often than words intended to describe women.

There are the main terms without which the topic of the study of language can't be discussed.

Sex is generally understood as a designation attributed to physiological and biological factors that foster individual classification as one of the two expected sex categories, male and female [7, p. 184].

Gender refers to socially constructed roles, behaviors, activities, and attributes that a given society considers appropriate for men and women [7, p. 184].

Feminities are feminine words that are alternative or paired with similar "masculine" concepts. But it should be immediately clarified that the term “gender-specific job title” is much more common in modern English. So, a gender-specific job title is the name of a job that also specifies or implies the gender of the person performing that job [6].

Nowadays there is another trend in English, gender neutrality, which has already been accepted on the international level. For example, a document named “Gender-neutral language in the European parliament” was developed by the European Parliament in 2008, and it has greatly influenced the language policy in EU state institutions. In this official document issued by this organization, the following definition of gender-neutral language is given: “Gender-neutral languages a generic term covering the use of nonsexist language, inclusive language or gender-fair language. The purpose of gender-neutral language is to avoid word choices which may be interpreted as biased, discriminatory or demeaning by implying that one sex or social gender is the norm. Using gender-fair and inclusive language also helps reduce gender stereotyping, promotes social change and contributes to achieving gender equality” [9]. All this was done in order to demonstrate equality of all genders.

Below the most used tools of forming feminatives in English are displayed [9]:

- actor/actress – actor (still gender-neutral);
- teacher/female teacher – teacher (still gender-neutral);
- chairman/chairwoman – chairperson;
- steward/stewardess – flight attendant;
- he or she – they.

But, if we talk about Russian, it chose another way. Even taking into account that the Russian language is formally considered as gender-neutral (or, to be more clear, masculine gender is considered as one) more and more people has started to doubt it and claim to add more feminatives. Their goal is to make Russian more gender-inclusive because a lot of them are follower of the hypothesis of linguistic relativity. Its main idea is that a language determined consciousness and as a result through changing the language we can change consciousness as well [4, p. 77].

However, it should be immediately mentioned that feminatives have existed for a long time in the Russian language. Even more popular they became in the first half of the XX century. During the early soviet period we can see such words as “архитектриса”, “лектриса”, “инспектриса” as well as “женкор” (женский корреспондент) and “женорг” (женский организатор). But during and



after the Stalin's period feminatives lost their popularity. Nowadays more and more people are trying to make them widely used again but with some changes. For example, now the suffix "к" has replaced the previously popular "ис" (архитектриса – архитектарка) [1; 5].

Below the most used Russian feminatives are displayed [2].

Modern suffixes:

- -к- (журналистка);
- -иц- (лётчица);
- -ниц- (писательница);
- -чиц- (буфетчица);
- -щиц- (продавщица);
- -ин- (монахиня).

Old suffixes:

- -ис- (директриса);
- -есс- (принцесса);
- -их- (портниха);
- -ш- (барменша).

In the 10s of the XXI century, we can increasingly meet new feminatives in the materials of various Russian-language online publications. For example, in the material "Вопрос эксперту: что такое феминистская психотерапия", posted on the popular Wonderzine resource, Maria Sabunaeva is presented as a "феминистская психологиня-консультантка" [2]. Another example can be found in the materials on the website of the Dozhd TV channel, "Адвокатесса, которая была у него на пересылке, говорила, что якобы его систематически избивали" [2].

Considering all of the above, an anonymous survey with a small sample was conducted in order to find out people's opinion about the importance of feminatives in modern Russian. During this survey, eighteen students (16 female and 2 male) from the Institute of Social Sciences and International Relations (translation and translation studies) were interviewed. This sample is due to the fact that these students interact with both Russian and foreign languages on a daily basis, and as a consequence, the issue of changes in the Russian language is especially relevant for them.

During an anonymous survey, students indicated their sex, gender and attitude to feminatives in Russian with the answer options "yes" or "no".

As a result, 57% of the surveyed female students answered "yes", and 43% answered "no". 50% of the surveyed male students answered "yes", and the other 50% answered "no" during the sociological survey.

Summing up, it is safe to say that the gender aspect of language is becoming more and more relevant in our time, both among politicians and among ordinary people. Russian feminatives are beginning to play an increasingly important role in the modern Russian language and more and more people are beginning to relate positively to them. As mentioned above, feminatives have two main goals: to make women more visible in society and to change their position in it through changing the language. Referring to the experience of the English language, it can be said that all this, in its turn, is a prologue to the creation of a completely gender-neutral language. But as we know language is a living being and only time will tell whether feminatives will be able to take root.

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## **ЭВФЕМИЗМЫ В ПОЛИТИЧЕСКОМ ДИСКУРСЕ EUPHEMISMS IN POLITICAL DISCOURSE**

**Аннотация.** В данной статье рассматривается роль политического дискурса в коммуникационном процессе, а также исследуются функции политической коммуникации.

Основное внимание уделено понятию эвфемизма как инструменту политического влияния и эмоционального воздействия на аудиторию. Стратегии убеждения и иные мотивы употребления политических эвфемизмов проанализированы на материале выступлений президентов США. Исследование политических эвфемизмов представляется интересным в силу увеличения важности политкорректности в политическом дискурсе.

**Abstract.** In this article we examine the role of political discourse in the communication process as well as explore the functions of political communication. A primary focus is made on the concept of euphemism as a tool of political influence and emotional impact on the audience. Persuasion strategies and other motivations for the use of political euphemisms are analyzed based on the material from US presidents' speeches. Political euphemisms provide an interesting study because of the increasing significance of political correctness in political discourse.

**Ключевые слова:** эвфемизмы, политические эвфемизмы, политический дискурс, коммуникация, воздействие.

**Key words:** euphemisms, political euphemisms, political discourse, communication, influence.

The communication process is always inextricably linked to the process of speech activity. At the present stage of lexicology development there is a tendency to study the problems of vocabulary functioning in connection with the development of the society, that is analyzing groups of thematic vocabulary as well as professional and term-system vocabulary. Nowadays economic, military, scientific, socio-political vocabulary and the language of mass communication are increasingly becoming the object of researchers' attention. In any of these spheres of human activity the development of vocabulary is closely related to events and geopolitical transformations in the world.

The key to successful international relations, as well as integration with other states, is a systematized and standardized vocabulary in those areas of activity that most often become the subject of coordination and discussion at the state level. One of the most important one among these branches is diplomacy.

The language of diplomatic documents is a language to which high requirements are imposed since the state communicates in this language with the outside world and to a greater extent an official is judged by it. A characteristic feature of the language of diplomatic documents is the availability of vocabulary, accuracy and clarity, while the use of commands is uncharacteristic. Requests or wishes are mostly expressed in the conditional way.

Speaking of political language, it is necessary to mention that it can be understood in a narrow and broad sense. Any text devoted to the political life (analytical articles, slogans, appeals to people, laws, declarations of rights, etc.) can be attributed to this language. In a narrower sense it means the administrative language, the language of political speeches, etc.

Let us take a closer look at political speech and its style. Often the content of the speech of politicians depends on the recipient. When addressing the people, a political speech is saturated of precise and unambiguous formulations where the speaker resorts to reductionism, clearly outlining a position that is aimed at emphasizing the unity of the president of the ruling party with the people. Speakers also resort to expressive structures for emotional impact on the audience.

The fundamental difference between political and diplomatic language lies in the relationship between the acquired meaning of the word and its original nominative function, in the context of which the speech elements can be interpreted in various ways, being included in other semantic contexts. Political speech is characterized by the use of terms, including borrowings of Greek and Latin origin, the use of abbreviations, euphemisms, etc.

In modern linguistics, political communication is considered as one of the dominant functions of persuasion and control, as a result of which the political consciousness of citizens is formed, so political ideals, values and norms of civil-state relations arise.

Political communication cannot exist without an appropriate means of its implementation. As noted by G. Lasswell, “the language of politics is the language of power. This is the language of solutions. It registers decisions and makes amendments to them. This is a battle cry, a verdict and a final judgement, a law, a resolution and a norm, an official oath, controversial issues, comments and debates” [1, p 264].

One of the most euphemistic styles of speech is the speech of politicians and diplomats because of its scope of use and practical purposes. To carry out political activity at a high level in our modern society it is necessary to objectivate phenomena and concepts of the social sphere. In order to veil negative sides of reality, modern politicians resort to the political speech as an instrument of influence on the mass audience.

An objective assessment of these linguistic units is given by J. Lawrence who notes that euphemisms have always been allies of military and political maneuverings, so they are inseparable [2, p 43].

Therefore, in order to achieve a certain goal, political leaders introduce special strategies into their speech that affect people's beliefs. US politicians are no exception and also use euphemisms to conceal the course of foreign and domestic policy. Below are a number of examples of the use of political euphemisms.

Barack Obama in 2012 after winning the election emphasizes: “It doesn't matter if you're black or white, Hispanic, Asian or Native American, young or old, rich or poor, able-bodied, disabled, gay or straight” [3].

The euphemisms “black” and “Native American” make it possible for a politician to exclude words from speech that will be assigned to race. By applying these language units, the president uses the cooperating function of speech and emphasizes the universal equality of citizens of the state.

Let us consider a specific example of using euphemisms within the most appropriate nominative function of representatives of all nationalities: “What makes America exceptional is the borders that unite the most diverse nation on Earth” [3]. “Diverse nation” is a euphemism that serves for the politically correct nomination of citizens of different nationalities inhabiting the country.

Another example involves the use of euphemisms by Barack Obama during a speech to Congress when he tried to mitigate criticism of the actions of the US President George Bush: “Here in Washington, we have all seen how quickly good intentions can turn into unfulfilled promises and wasteful spending” [4]. In this context the word “Washington” is the designation of the location of the White House which implies power.

Let us consider the statements of the forty-fifth President of the United States Donald Trump. During his inaugural speech the politician used repeated promises to implement the program. It is also important to mention that the sentences are organized in a short parallel structure, which contributes to a positive perception of speech by the society: “America will start winning again, winning like never before. We will get our jobs back. We will return our borders. We will get our wealth back. And we will get our dreams back. We will build new roads, highways, bridges, airports, tunnels, and railways all over our wonderful country. We will free our people from social security and return them to work – we will rebuild our country with American hands and American labor” [5].

After meeting with Mexican President Enrique Peña Nieto, Donald Trump delivered a speech in Phoenix. Then the Republican presidential candidate submitted his remarks regarding the views on immigration. Even though the politician took a hard-line stance during the primaries, he used euphemistic structures in his speech paying considerable attention to the problems of illegal immigrants from Latin American countries. Let us consider the following example: “We must also honestly acknowledge the fact that not everyone who aspires to join our country will be able to successfully assimilate” [6].

The euphemistic structure “not everyone who aspires to join our country will be able to assimilate successfully” does not discredit immigrants whose problem is assimilation in American society, but rather conveys the country's positive attitude to immigration.

Political discourse is a social phenomenon representing the communication process in the sphere of political activity. The use of euphemisms, the empowerment of terms with special meanings is always aimed at controlling the behavior of citizens, namely their political consciousness. The interaction of the communicator and the recipient where the communicator uses the above-mentioned means, is decisive in political communication, which will allow manipulative activity on the part of the subjects of power.

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## **К ПРОБЛЕМЕ РАЗГРАНИЧЕНИЯ ЯЗЫКА И ДИАЛЕКТА ON THE PROBLEM OF LANGUAGE AND DIALECT DIFFERENTIATION**

**Аннотация.** В статье рассмотрены основные подходы к проблеме разграничения понятий языка и диалекта. Детально проанализирована концепция, предложенная Х. Клоссом, позволяющая дифференцировать две данных языковых системы. Описаны термины и рассмотрены возможности применения концептов «Abstandsprachen» и «Ausbausprachen» для классификации конкретных языков, языковых систем и диалектных континуумов, расположенных на территории европейских государств. На основе анализа языковых ситуаций стран европейского региона, автор приходит к заключению, о том, что основным фактором при дифференциации статусов языковых систем является социолингвистический аспект.

**Abstract.** The paper discusses the main approaches to the problem of distinguishing the concepts of language and dialect. The concept proposed by H. Kloss is analyzed in detail, which allows differentiating the two given language systems. The terms and possibilities of using the concepts “Abstandsprachen” and “Ausbausprachen” for the classification of specific languages, language systems and dialect continuums located on the territory of European states are described. Based on the analysis of the linguistic situations of the countries of the European region, the author comes to the conclusion that the main factor in differentiating the statuses of language systems is the sociolinguistic aspect.

**Ключевые слова:** диалект, язык, диалектный континуум, региональный язык, «аусбау-язык».

**Key words:** dialect, language, standard language, dialect continuum, regional language, “ausbau-language”.

There are also much more complex situations for the demarcation of language and dialect for language systems that do not have a written language, or for example, as in the case of Scottish and English. In addition, there are difficulties in determining the status of an idiom in a situation that is polar opposite – related to the position of a number of dialects in modern China and the literary language, when the state language unites idioms that have diverged far from the point of view of structural linguistics.

The solution of such problems created German linguist H. Kloss the concept of “abstand” and “ausbau” languages, also known as the “Ausbau paradigm”. To describe an ambiguous problem in his theory, he linked two factors determining the status of a language – political and linguistic. In general, it fits into the concept proposed by H. Kloss, who distinguishes two sociolinguistic models of languages: “Abstandsprachen” and “Ausbausprachen” [2].

Often, many regional languages are considered lower in terms of development relative to the official language of the state, and are often unfairly attributed to the dialect of the language. This is precisely because of the genetic proximity of idioms [1, p. 107].

The so-called “Abstandsprachen” are separated languages, from the point of view of the structure of the language, the Basque language is a classic example of such a language. Its status is obvious due to purely linguistic features, and most importantly, it differs from the languages of its immediate geographical neighbors, such as Welsh or Scottish (Gaelic) relative to English, since they both belong to another group of languages. The linguistic differences of such languages make their dialectization and assimilation of the linguistic minority within the national state very difficult [2].

“Ausbausprachen”, in turn, can be distinguished on the basis of cultural, social, political, historical and linguistic reasons. However, “abstandsprache”, which can be translated into English as distant languages, where distance means not geographical remoteness of languages, but genealogical. As an example, the scientist cites the Basque and Hungarian languages, which are languages of a different language family, compared to the languages that surround them are not mutually intelligible for speakers of languages of geographically closely spaced countries. Thus, these languages are quite autonomous, have clear structural differences, stand out from the general dialect continuum, and even being unwritten, linguists will undoubtedly call such an idiom a language.

Thereby, the concept of “Abstandsprachen” mainly focuses on linguistic factors, and “Ausbausprachen” can be defined as a sociolinguistic category having a dynamic character.

It should be noted that “Ausbau” are languages according to the classification of the sociolinguistic typology of language systems described earlier. Kloss, are, in essence, socio-political constructs, but it is necessary to mention the exclusively linguistic side of this issue.

A striking example of this type of language situation is Basque in Spain, Breton in France, which are not related to the languages of the state, including, most importantly in this case, are not close to the dialects of the official language and cannot be qualified as dialects. Note that, thus, this type of language situation corresponds to “Abstand” in the terminology of H. Kloss.

H. Kloss emphasizes that objective linguistic data on the kinship of languages may not always be decisive in a dispute about whether to consider two idioms as separate languages or consider them as a language and dialect, thereby raising the status of one and belittling the status of the other. It is especially important to note in this regard that not one of the listed aspects is not absolute, only one of them can be dominant for each individual language situation.

And it should be considered as a dialect continuum, regardless of the official borders of the states with the “centers” of the most powerful and developed languages, which have acquired a literary norm and have prestige in the language community.

The same point of view regarding the variability of the status of language systems is held by P. Tragill, exploring the continuum of Scandinavian continental dialects, in particular the Norwegian language, established the fact that languages can become dialects, and dialects languages, linking this directly with the loss and acquisition of language autonomy. In addition, the author also allowed extrapolation of these conclusions into the languages of Europe [3].

In many ways, the key factor in the issue of distinguishing the status of languages and their variants can be called the state and the redrawing of state borders – the consolidation or disintegration of state entities, and on the other hand, it is the political will of the people [4, p. 4].

This happened to the Luxembourgish language when, with the formation of a separate independent state of Luxembourg in 1984, it became necessary to approve the national language of the country, which became one of the Upper German dialects. In addition, history knows quite a few such examples; this also applies to the examples already given in the case of the Basque language and dialects of the Chinese language, which, from the point of view of their structural features, have all the prerequisites to be considered separate independent languages.

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## **ОСНОВНЫЕ СТРУКТУРНЫЕ МОДЕЛИ В ДЕЛОВОЙ ФРАЗЕОЛОГИИ BASIC STRUCTURAL PATTERNS IN PHRAZEOLGY OF BUSINESS ENGLISH TERMS**

**Аннотация.** Статья посвящена значительным на данный момент времени структурным моделям деловой фразеологии в английском языке. Актуальность данной работы состоит в необходимости установления перечни употребляемых базовых моделей в англоязычной деловой фразеологической терминологии с целью подготовки к дальнейшему определению универсальных и специфических характеристик ФЕ-терминов в родственных языках. В основном деловая фразеология включает в себя фразеологические единицы, представляющие собой двухкомпонентные субстантивные модели. В данной работе разбираются наиболее



интересные, по мнению автора, структурные модели, а также приводится большое количество примеров из словаря «Компьютерные и интернет-термины» Джона С. Ригдона. Посредством изучения основных структурных моделей в деловой фразеологии выясняем, что ФЕ-термины составляют значительную часть фразеоконса современного английского делового словаря – около 60%.

**Abstract.** The article is devoted to the currently significant structural models of business phraseology in the English language. The relevance of this work lies in the need to establish lists of basic models used in English business phraseological terminology in order to prepare for the further definition of the universal and specific characteristics of phraseological units in related languages. Basically, business phraseology includes phraseological units, which are two-component substantive models. In this work, the most interesting, in the author's opinion, structural models are analyzed, and also a large number of examples from the dictionary "Computer and Internet terms" by John S. Rigdon are given. By studying the basic structural models in business phraseology, we find out that phraseological units make up a significant part of the phraseological window of the modern English business dictionary – about 60%.

**Ключевые слова:** деловая фразеология, фразеологические единицы, структурные модели.

**Key words:** business phraseology, phraseological units, structural models.

The subject of my research is the componential structure of frequent syntactic patterns of PU-terms fixed in John C. Rigdon's Dictionary of Computer and Internet Terms [6, p. 10]. PU-terms are complex linguistic units. Knowledge of the grammatical structure of phraseological units contributes to the understanding of their meaning.

The study of the structure of business phraseology is dictated by the pragmatic and communicative demand of the business language in the modern world. Moreover, the identification of structural models of phraseological units and their classification is justified by the need to establish the nomenclature of the phraseological terminology of business discourse in the English language [1, p. 26]. Phraseological, component-structural and quantitative analysis of 262 two-component phraseological units selected by us made it possible to identify 13 structural and grammatical models.

The structural analysis of the Dictionary entries results in the following frequent syntactic patterns of PU-terms:

Model 1. *N + N* is a two-component substantive grammatical model with constant and constant-variant dependence of components [3, p. 39]. This structure includes 105 phraseological units. For example, *image sequence* ~ a consecutive series of images created from consecutive video frames, *job object* ~ a system-level structure that allows processes to be grouped together and managed as a single unit, *cash mountain / pile* – money that a company can spend, for example, to buy other companies, or give to shareholders; *straw poll* – when people are asked their opinion about something in an informal and informal way; *buzz marketing* (word of mouth) – marketing in which a company convinces a small group of people who know a lot about a product to tell other people about its benefits so that they are interested in it and want to buy it; and etc.

Let's give examples of the use of phraseological units of this model in the context:

The group's *cash mountain* has shrunk.

A quick *straw poll* of delegates revealed that most would prefer a longer conference.

*Buzz marketing* is not new, but Internet technology has changed the way in which companies use it.

This model allows for the presence of variability of components (boiler room / shop, shadow market / economy, glass ceiling / wall).

Model 2. *Adj + N* is a two-component adjectival-substantive grammatical model with constant and constant-variant dependence of the components. This structure counts 79 FE-terms. For example,

*affirmative action* HUMAN RESOURCES – when employers give jobs or other opportunities to people who would normally be treated unfairly because of their race, gender, etc.; *blue chip* – a share in a well-run, successful company with a long history of shareholders in different economic conditions; *soft landing* – when the economy slows down after a period of rapid growth but does not go into recession, etc.

Here are examples of the use of this model's FE-terms in context:

The conference is aimed primarily at public and private sector full-time trade union officials and senior lay trade union representatives. The central theme will be the active role to be played by trade unionists in working for the promotion of employment equality and *affirmative action*.

Wall Street closed Thursday with *blue chips* falling and technology stocks managing as light gain.

The Fed attempted to manage an economic *soft landing* by gradually lowering interest rates.

This model allows for variation in the components (cold/blind call, psychic/psychic income, dear/tight money).

Model 3. *Participle I + N* is a two-component participle-substantive grammatical model with constant and constant-variant dependence of the components [4, p. 53]. This structure counts 15 FU-terms. For example, *lagging indicator* is an indicator that only follows what has recently happened in the economy; *leading edge* is an area of activity using the latest and most advanced methods and equipment; *creeping takeover* is a takeover, which involves gradually buying up company shares from different shareholders until the buyer has enough shares to take over the company, instead of buying up a fixed number of shares from all shareholders at a fixed price, etc.

Here are examples of the use of this model's FE-terms in context:

Employment a *lagging indicator* of economic strength because many companies don't cut their work until they are certain that conditions require it.

Software companies are on the *leading edge* of technology in very competitive markets.

The company has denied it is plotting a *creeping takeover*.

This model allows for variation of components (crawling/sliding peg, gagging/gag clause, floating/open insurance).

Model 4. *Participle II + N* is a two-component participle-substantive grammatical model with constant and constant-variant dependence of the components. This structure counts 9 FE-terms. For example, *depressed area* is an area in a large city or part of the country where houses and other buildings are in bad condition, unemployment is high and many people are poor; *fallen angel* is a bond whose rating when issued was very high but subsequently fell below investment grade; *dead time* is time that is not used; etc. [5, p. 22].

Here are some examples of the use of the FE-terms of this model in context:

Local councils are obliged to allocate 15% of council housing to people from *depressed areas*.

Those bonds in recent months have turned into *fallen angels*, as rating agencies down grade them.

A business on spends 60 hours on the telephone, but until now little imagination has been applied to using this *dead time*.

This model allows for variant components (naked/nude contract, sweated/sweat labour).

Model 5. *N compound + N* is a two-component compound-substantive grammatical model with constant and constant-variant component dependence. This structure counts 22 FE-terms. For example, *gentleman's agreement* – a verbal informal agreement made between people who trust and respect each other; *sunrise industry* – an industry dealing with new technologies; *peppercorn rent* – a small amount of money paid to confirm the existence of a formal contract between the owner and the tenant; etc. [2, p. 15]

Here are some examples of the use of this model's FE-terms in context:

It suited both parties for their arrangements to be by *gentleman's agreement*.

The crusher industry is still a young industry in China; on the other hand, it is a *sunrise industry*, too. After two decades of hard work, there are lots of enterprises in the market, we have some successful companies, but most of them are in the very early stages of the business.

The land will then be leased to the council at a *peppercorn rent*.

This model allows for variant components (graveyard/bear market).

The results of the analysis show that the structure of two-component phraseological units in business English is diverse. In addition to the structural models in business phraseology I have given in, there are also *Adj compound + N*, *N + conj + N*, *Adj + N compound*, *Participle I compound + N*, *N + prep + N*, *prep + Adj + N*, *V + (d) + N*, *V + conj + V*. In my opinion, I have highlighted the most interesting and frequently used models.

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**РОЛЬ ПОСТРОЕНИЯ ПРЕДЛОЖЕНИЯ В РЕЧИ  
КАК СПОСОБ ОЦЕНКИ МОТИВАЦИИ ЧЕЛОВЕКА  
THE ROLE OF SENTENCE CONSTRUCTION  
IN SPEECH AS A WAY TO ASSESS A PERSON'S MOTIVATION**

**Аннотация.** Статья дает анализ понятий и проблем, возникающих в психолингвистике. Статья дает анализ понятий и проблем, возникающих в психолингвистике. Целью данной работы является рассмотрение теории, касающейся психолингвистики и ее составных частей, также рассмотрение этапов формирования речевого процесса и ситуаций использования лексики английского языка на примере исследования Бенджамина Вилковски. В ходе работы университета Вайоминг, были отобраны слова, использующиеся для определения мотивации человека и указан дальнейший анализ употребления слов в контексте. Также рассмотрен пример взаимосвязи процесса мотивации с процессом формирования речи, включая влияние мотивации на структуру речи, построение грамотного предложения. Данная тема достаточно обширная и требует большего количества работ по изучению разных аспектов и деталей. Важным является то, что, полученная в ходе дальнейшего изучения психолингвистики, информация будет важна и в других смежных областях и науках.

**Abstract.** The article analyzes the concepts and problems arising in psycholinguistics. The purpose of this work is to consider the theory concerning psycholinguistics and its components, as well as to consider the stages of the formation of the speech process and situations of using the vocabulary of the English language on the example of Benjamin Wilkowski's research. During the work of the University of Wyoming, the words used to determine a person's motivation were selected and further analysis of the use of words in the context was indicated. An example of the relationship between the process of motivation and the process of speech formation is also considered, including the influence of motivation on the structure of speech, the construction of a competent sentence. This topic is quite extensive and requires more work on the study of various aspects and details. It is important that the information obtained in the course of further study of psycholinguistics will be important in other related fields and sciences.

**Ключевые слова:** психология, лингвистика, язык, средства коммуникаций, мотивация, цель.

**Key words:** psychologies, linguistics, language, means of communication, motivation, purpose.

This scientific work is devoted to the study of concepts and problems related to psychology and linguistics, as well as the interaction of the two sciences and the manifestation of this in theory and in practice. The involvement of specific phenomena of language in psychological practice is

traced. As a result, there is an interdisciplinary branch of knowledge that systematically explores the psychological aspect of language – psycholinguistics.

The relevance of this article lies in the fact that it affects several areas: psychology and linguistics.

The topic of psycholinguistics is quite common and is raised in scientific works, articles and books by such scientists as: A.A. Leontiev, Wilhelm von Humboldt, G. Steintal, A.A. Potebnya, L.V. Shcherba, G. Guillaume, O. Niemeyer, N. Chomsky, J. Miller, L.S. Vygotsky, Benjamin Wilkowski, A.V. Kazanskaya and others.

Psycholinguistics is a field of linguistics that arose on the basis of the interaction of psychology and linguistics. Thanks to this science, it is possible to study the manifestations of psychological phenomena through speech activity. It can also be noted that psycholinguistics studies the relationship between language, thinking and consciousness. The subject of psycholinguistics is speech itself and its features of manifestation. The object is “a set of speech events or speech situations” [4, p. 16]. Since speech plays a significant role in psycholinguistics, we will analyze its appearance and features.

Speech is one of the first types of activity and is one of the ways to express your desires and emotions, a way of communicating with the outside world. The following stages of speech formation can be distinguished [1]:

- the development of motivation for the act of speech, thereby the beginning of the reproduction of one's thoughts and motives;
- expanding their capabilities in presenting information to others, namely: expanding vocabulary and competent sentence construction;
- development of forms of speech, which include dialogue and monologue.

Thus, speech serves as a tool for a person's self-expression, the transmission of their inner experiences, a way to realize motives. Motivation gives an impetus to the beginning of the development of the process of speech activity, thereby forcing the child to communicate and use communication signs in his life.

Considering speech from the point of view of psychology, we can give the following definition. Speech is a cognitive mental process that has pronounced and perceived sounds that have a meaning characteristic of written signs. A.A. Leontiev considered speech as an activity, the components of which are: goals, motives and speech actions and means [3]. Due to the fact that speech arises in a person only under the influence of motives, it can be noted that speech is an expression of a person's purpose and motivation, through which his goals are determined, actions and behavior are explained.

One of the works on psycholinguistics is a study by Benjamin Wilkowski and the staff of the University of Wyoming. The objective of this work was to study the vocabulary of the English language and determine the factors motivating personality behavior [5].

Behavior is determined by intentions and desires, based on which a person decides what is a priority for him and builds a further model of actions. In the course of the work, the researchers identified 4 groups of aspirations, which include: fame, inclusivity, avoiding negativity and following traditions. As a consequence, this classification was designated as PINT: prominence, inclusiveness, negativity prevention, tradition. The use of the words chosen for the categories in different situations is considered: “The word church (church) will not be an adequate indicator of adherence to traditional values for non-Christian cultures, and the lexical unit fatness (fatness), in turn, will not be a marker of the category “avoiding negativity” in cultures where hunger is a more serious problem than obesity.” Thus, we received data that due to the use of certain English words used to describe the desires and motives of their actions, there is a classification of goals. This shows the relationship between the lexical and psychological sides [5].

Another example is the work of Anna Kazanskaya “Speech errors in the motivational aspect”, which examines the influence of personality motivation on the structure of speech. The basis is that motivation determines the initial idea and influences the process of implementation, thereby explaining the reservations and the process of constructing the proposal as a whole [2].

In conclusion, psycholinguistics is a fairly widespread and relevant science. The problems that psycholinguistics deals with are multifaceted and complex. Some of them require both psychological and linguistic competence, while the solution of others requires theoretical understanding and further practical application. The peculiarity is that in the course of studying, penetrating deep into the problems, the information baggage is replenished not only for this science, but also for related ones. Thus, the research is aimed at substantiating and studying the manifestation of psychological characteristics through speech activity. Summing up, it can be noted that the state of psycholinguistics as a science is at the stage of active scientific research.

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## **СОВРЕМЕННЫЕ СМИ КАК ИНСТРУМЕНТ МЯГКОЙ СИЛЫ В РОССИИ MODERN MEDIA AS AN INSTRUMENT OF SOFT POWER IN RUSSIA**

**Аннотация.** В данных тезисах автор сделал попытку отражения нынешних тенденций развития политического механизма – мягкой силы – в России. Автор обратился к классическому определению мягкой силы, выявил качественную разницу между определениями мягкой силы и жёсткой силы, мягкой силы и пропаганды. Определено место мягкой силы в концепции внешней политики России. Представлен инструментарий мягкой силы, из которого выделены СМИ как самый эффективный механизм воздействия на массовое сознание. Отмечена специфика современных СМИ как инструмента мягкой силы: основные функции, представление образа врага, его медийные архетипы. Приведён пример деструктивного эффекта СМИ как инструмента мягкой силы. Отмечается взаимосвязь между набором факторов, образующих имидж государства на внешнеполитической арене, и необходимость подхода к формированию привлекательного образа страны не только с помощью инструментов мягкой силы.

**Abstract.** In these theses, the author made an attempt to reflect the current trends in the development of the political mechanism – soft power – in Russia. The author turned to the classical definition of soft power, revealed a qualitative difference between the definitions of soft power and hard power, soft power and propaganda. The place of soft power in the concept of Russian foreign policy has been determined. The toolkit of soft power has been presented, from which the media have been singled out as the most effective mechanism for influencing the mass consciousness. The specificity of modern media as an instrument of soft power has been noted: the main functions, representation of the enemy image, his media archetypes. An example of the destructive effect of the media as an instrument of soft power has been given. The author notes the relationship between the set of factors that form the image of the state in the foreign policy arena, and the need to approach the formation of an attractive image of the country not only with the help of soft power tools.

**Ключевые слова:** мягкая сила, медиaprостранство, внешняя политика, имидж государства, мягкая политика.

**Key words:** soft power, media space, foreign politics, state image, soft politics.

In the current realities, international relations of the post-industrial (information) era are determined not only by the military potential of the parties, as it was throughout the 20th century; now, “whose positive image will win” [5] in the media space also has a great influence.

To build a good image, the state can use several instruments of soft power. In the late 1980s, this concept was first formulated by the American political scientist George Naya. By his definition,

“soft power” is “the ability to obtain the desired results in relations with other states due to the attractiveness of one's own culture, values and foreign policy” [6].

In contrast to hard power, which focuses on the coercion of subordination or cooperation through military aggression, economic or political sanctions, the soft power strategy presupposes the voluntariness of the choice of the society – the main addressee of soft politics messages.

Soft power is not identical to propaganda in the negative meaning in which it is accustomed to perceive it in Russia and abroad. The phenomenon of soft power is the conscious choice of the opposite side based on the idea of attractiveness.

By the way, propaganda is not always guided by the attractiveness of the broadcast images; it allows various ways to manipulate the audience's consciousness, which is virtually impossible to apply within the framework of soft power. The mechanisms of blackmail, coercion, substitution of facts inherent in "hard power" and propaganda are opposed to soft power. This approach has its own tools and landmarks: “soft” policy is focused on dialogue with the opposite side, long-term cooperation.

As an actual method of Russia's foreign policy, the use of soft power is defined in article 9 of the Foreign Policy Concept of the Russian Federation of 2016, which states: “9. The use of tools for solving foreign policy tasks is becoming an integral part of modern international politics of a “soft power”, primarily the capabilities of civil society, information and communication, humanitarian and other methods and technologies, in addition to traditional diplomatic methods” [2].

The soft power of any state should be viewed as a kind of potential that can be accumulated and used or wasted. Availability of the attractiveness of something must still be revealed, shown to the other side. The special task of soft power tools is precisely to unleash this appeal. There are some particular examples activity of the attractiveness of a certain state sphere (or non-governmental organization), which positively influence the opposite side opinion without additional efforts or actions. However, then the question arises about the definition of the concept of soft power, which itself implies a certain activity.

The main instrument of soft power is public diplomacy. This also includes non-governmental organizations, universities, interaction with non-state actors to promote soft power, and media coverage of the agenda.

In terms of the influence degree on the audience, the media occupy a dominant place in the toolkit of soft power. The media have several functions within the framework of foreign policy the main of which are the function of forming public opinion by covering reality from a “more “correct” angle in the right ideological perspective” [4] and the function of a “social trigger”. The second function follows from the first: a message broadcast to the audience from the right angle is able to induce it to take real action, civic and political activity.

Soft power can be used not only to create a positive image of the state, but also to create an unattractive image of the opposite or the third party. A political figure, strategically broadcasted as negative or unattractive, gets into the minds of the masses and transforms into the image of an enemy. If this image contains a threat to the state, homeland, people, then society begins to rally and mobilize against a common hostile force.

The image of the enemy in the media space is an effective tool for protecting the ruling political regime that can activate the feeling of patriotism in society. This image most often represents an evaluative characteristic of the enemy, which formed in the mass consciousness.

The enemy may not be a specific person, but a cumulative image of everything negative, detrimental to one's own culture, people, and identity. For each specific society, state, people with their own historical heritage the media image of the enemy acquires unique features.

The image of the enemy in the American media discourse is archetypal: the Russian “barbarian” with neo-imperialist intentions, which “encroaches” on the “sacred” democratic regime in general and other countries in particular [8]; in turn, the archetypal image of a human bearer of Western culture with values alien to the “Russian world” is inherent in the media space of Russia [3].



In the context of soft power, the negative image is represented veiled, bypassing the propaganda principle “who is not with us is against us”. A harsh-sensitive digital society favors a realistic portrayal of the side that was chosen to broadcast as hostile.

Nowadays, domestic media have a low level of trust in their audience: according to the Levada Center for 2020, the level of trust in television as a reliable source of news was 52% [1]. Despite such statistics, the media are capable of both significantly improving the image of the state in the international political arena and causing irreparable reputational damage to it.

A striking example of the opposite effect can be considered is the media coverage of Crimea Republic and Sevastopol city entry into the Russian Federation in 2014. The event was broadcasted by the majority of domestic media as “the return of Crimea to its native harbor”. Abroad, the referendum was called “annexation”, and Russia's actions towards the peninsula were assessed as “aggressive and nationalistic” [7].

Despite the fact that in the modern information age military potential often plays a decisive role in solving foreign policy problems, soft power politics is gaining more and more weight. It is unrealistic to focus only on “soft” methods of influence in foreign policy, because the image of the state is determined by a combination of economic, socio-cultural, political and other factors.

At the same time, in the era of globalization, blurring of cultural boundaries, methods of manipulating public consciousness in the socio-cultural space pose a particular danger to states.

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**ТРУДНОСТИ ПЕРЕВОДА «МЕТАФИЗИКИ» А.Г. БАУМГАРТЕНА  
С ЛАТЫНИ НА РУССКИЙ ЯЗЫК  
DIFFICULTIES IN TRANSLATING A.G. BAUMGARTEN'S "METAPHYSICS"  
FROM LATIN INTO RUSSIAN**

**Аннотация.** На сегодняшний день мы имеем множество трудов научного и художественного характера, написанных на латыни, но не переведенных на русский язык. Тезисы посвящены описанию трудностей, возникших при переводе нескольких параграфов «Метафизики» А.Г. Баумгартена с латыни на русский язык. В результате перевода были выявлены наиболее существенные трудности, сформированы эффективные способы их преодоления, а также подобраны примеры из анализируемого текста, дающие наглядное представление о возникших проблемах. В данной работе проведено подробное исследование лексических и грамматических трудностей с углублением в полисемию, специальную терминологию, морфологию и синтаксис. Изучаемые вопросы заинтересуют специалистов гуманитарного профиля, занимающихся переводом с латыни на русский язык как философских, так и общенаучных текстов.

**Abstract.** Nowadays we have many works of a scientific and artistic nature written in Latin, but not translated into the Russian language. This work is devoted to the description of the difficulties encountered while translating several paragraphs of A.G. Baumgarten's "Metaphysics" from Latin

into Russian. In the process of translation, the most significant difficulties were identified, effective ways of overcoming them were worked out, and examples from the analyzed text were selected, giving a visual representation of the problems that arose. In this paper, a detailed study of the lexical and grammatical difficulties with the in-depth study of polysemy, special terminology, morphology and syntax problems is carried out. The issues under discussion will be of interest for specialists of humanitarian field engaged in translating both philosophical and general scientific texts from Latin into Russian.

**Ключевые слова:** трудности перевода, философия, латынь, русский, «Метафизика», А.Г. Баумгартен.

**Key words:** difficulties of translation, philosophy, Latin, Russian, "Metaphysics", A.G. Baumgarten.

Tight connection between philosophy and the Latin language has been going on for many centuries, but particularly the 17<sup>th</sup> and 18<sup>th</sup> centuries are considered the heyday of philosophical ideas and discoveries. At that time, such famous scientists as M. Lomonosov, H. Wolf, G. Leibniz, L. Euler, I. Formey, A. Baumgarten and many others lived and worked. Latin became the companion of all great undertakings and labors because it was this language, now "dead", that was considered absolutely "alive" at that time and was the main language of science in Europe. Many scientific and artistic works were written in Latin. Of course, the relevance and necessity of translating these texts is incredibly high.

However, a modern translator will inevitably face with a number of difficulties that he will have to overcome to make the result of translation understandable to the reader and at the same time make it correspond to the original text as much as possible. The purpose of the study is to highlight difficulties that arise while working on the translation from Latin into Russian and to propose the most effective ways to deal with these difficulties relying on our own experience of translating A.G. Baumgarten's "Metaphysics". All translation difficulties that we have come across could possibly be distributed into the following groups:

1. Lexical difficulties:

- general linguistic difficulties (polysemy of lexemes);
- special terminological difficulties.

2. Grammatical difficulties:

- morphological difficulties;
- syntactic difficulties.

Now let us show on some examples each type of difficulty and how we managed to overcome it.

Both Russian and Latin lexemes are prone to polysemy which can be traced in all parts of speech. Some words may have completely opposite meanings and closely related meanings at the same time. It is very important to distinguish between these meanings in context because any inaccuracy in translation will entail distortions of the meaning of the original text. To choose the correct meaning, the translator needs to understand the context of the use of the word as accurately as possible and thoroughly study the dictionary entry devoted to a specific lexical unit. It is best to use big detailed dictionaries with examples given under each headword. Let us trace the phenomenon of polysemy of lexemes on the example of the fragment § 505, "*Cogito, mutatur anima mea (§ 125, 504)*" [2, p. 174] of Baumgarten's "Metaphysics". The verb *cogito* has five main meanings, among which several synonymous translation options can be distinguished. These are 'мыслить', 'думать', 'придерживаться мнения', 'воображать', and 'замышлять' [1, p. 200]. But what is the correct

word to translate the Latin verb? One should know that Baumgarten, like Wolf, understands “thoughts” as “conscious modifications of soul” [3, p. 108]. For him, thinking is a process of changing the soul that is why the most logical translation in this case is ‘мыслить’. So, we get, “Я мыслю, и моя душа меняется (§ 125, 504)”.

The next type of difficulties are terminological ones. We faced the problem of interpretation of terms used in “Metaphysics”. Here it will be important to note the influence of the Leibniz-Wolf school of philosophy on Baumgarten, who was its main representative in 1740s–1760s. Let us turn to the following paragraph, “§ 513. *Anima mea est vis (§ 505) repraesentativa (§ 506) universi (§ 507) pro positu corporis sui (§ 512)*” [2, p. 176], which in Russian sound like, “§ 513. *Моя душа есть сила (§ 505) представления (§ 506) мира (§ 507) сообразно положению своего тела (§ 512)*.” The translation of this paragraph may sound wrong if you do not know about the basic concepts on which Baumgarten's teaching about the soul rely. For example, if we translate *vis repraesentativa* as ‘сила изображения’ or ‘сила наглядного представления’ [1, p. 1084; 872], and not ‘сила представления’, and a Latin preposition *pro* as any of the ten translation options (‘перед’, ‘против’, ‘вместо’, ‘за’, ‘по сравнению’, etc.), except for the correct ‘сообразно’, in the Russian variant we will distort the terminology and understanding of Baumgarten's thoughts [1, p. 811].

When working with any Latin text, the translator will inevitably face a number of grammatical difficulties. These are general difficulties because the grammatical structure of the Latin language has a number of differences from the grammar of the Russian language, and specific difficulties connected with the grammatical features of the analyzed text. In the field of morphology, the most significant difficulty will be the discrepancy in the composition of verb forms and names. On the one hand, some Latin forms have no equivalents in the Russian language, on the other hand, there are forms familiar to a Russian-speaking person that are absent in Latin.

The lack of time differentiation in the subjunctive mood and the presence of only one of its forms in the Russian language makes it impossible to translate the forms of the developed Latin conjunctive out of context, and imposes a number of rules and restrictions in the context. The mood connects morphology and syntax, therefore, when translating a fragment of the paragraph of “Metaphysics”, “§ 109. *Cum existentiae oppositum in aliquo sit possibile (§ 54, 55), existentia aut erit absolute necessaria, aut in se contingens (§ 102, 10)*...” [2, p. 31] we pay attention to a number of details. This example is a sample of the use of the conjunctive mood in the subordinate clause of a compound sentence. When analyzing, we take into account that the conjunctive is used here in the subordinate clause together with the conjunction *cum*. Having the exact form of the verb and identifying the type of subordinate clause by conjunction as the subordinate clause of cause, we get the translation, “§ 109. *Так как существование противоположного в некотором возможно (§ 54, 55), существование является или абсолютно необходимым, или случайным само по себе (§ 102, 10)*...”

Due to the conciseness of “Metaphysics”, the final editing of the text should not cause great difficulties, however, even laconic phrases cannot always be translated literary. A more thorough translation involves substitution and clearly explains it. As a result, we get two possible translations of the fragment § 705 of “Metaphysics”, “*Multae actiones meae, immo omnes proprie dictae, hinc et actiones animae meae sunt spontaneae, adeoque vere tam illis, quam animae meae tribuitur spontaneitas (§ 704)*...” [2 p. 273]. The first literal translation looks like this, “§ 705. *Многие действия мои, даже оговоренные отдельно, отсюда и действия души моей есть производные, это верно равным образом до такой степени, что душа моя разделяется самопроизвольно (§ 704)*.” The second translation with substitutions has the following form, “§ 705. *Большинство моих действий, в собственном значении, а значит и действий моей души самопроизвольны, так же это верно настолько, что моя душа разделяется самопроизвольно (§ 704)*.”

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## **ПРОБЛЕМА РЕПРЕЗЕНТАЦИИ ГЕНДЕРНЫХ ОБРАЗОВ В СВЕТЕ КОГНИТИВНОЙ ЛИНГВИСТИКИ THE PROBLEM OF GENDER IMAGES REPRESENTATION IN COGNITIVE LINGUISTICS**

**Аннотация.** В работе рассматриваются основные теоретические понятия, связанные с проблемами репрезентации гендерных образов в когнитивной лингвистике. Обозначены

результаты теоретического анализа понятия «образ» в рамках когнитивной лингвистики и выделена специфика его образования; рассмотрен процесс формирования гендера в рамках культурных особенностей той или иной социокультурной общности; обозначены этапы и детерминированы особенности условий репрезентации гендерных образов в когнитивном направлении лингвистики; аргументировано положение о необходимости определения специфики репрезентации концептуальных аспектов гендерных образов в дискурсе. Значимость работы заключается в систематизации научных знаний о репрезентации образов в рамках когнитивной лингвистики и последующему практическому исследованию когнитивных механизмов и лингвостилистических форм по данной теме.

**Abstract.** The paper considers basic theoretical concepts connected with the problems of representation of gender images in cognitive linguistics. The main results of the theoretical analysis of the notion “image” within the framework of cognitive linguistics are pointed out and the specific features of its formation are defined. The process of forming gender image within the cultural patterns of sociocultural communities is considered. The stages and conditions of gender image representation are determined within the scope of cognitive linguistics. The necessity of determining the specific features of gender images’ conceptual aspects in discourse is pointed out. The relevance of the research consists in systematization of scientific knowledge concerning gender representation within the framework of cognitive linguistics and further practical analysis of cognitive mechanisms and linguostylistics forms.

**Ключевые слова:** дискурс, когнитивная лингвистика, гендерный образ, концептуальное содержание, репрезентация, формирование гендерного образа.

**Key words:** discourse, cognitive linguistics, gender image, conceptual content, representation, gender image formation.

Contemporary linguistic research applies such an approach to the concept of image according to which the image is considered as a complete and whole “organism”. It is able to perceive the eternal verities of being because not only does it exist as an object and bear certain meaning as a sign, but at the same time it presents this meaning by itself. M.N. Epstein identified the image primarily as an aesthetic category that characterizes specific way of exploration and transformation of reality [8, p. 254].

It is important to consider the term “image” from the point of view of linguistics by means of the term “internal form”. This term was introduced by W. Humboldt in the nineteenth century. As the internal form, he understood the system of notions that reflect the peculiarities of the worldview fixed by the external language form [1, p. 236].

Cognitive linguistics focuses its attention on the language as a general cognitive mechanism and cognitive instrument. The language is the system of signs essential for the representation of information or encoding and transformation of information or decoding. As E.S. Kubryakova pointed out, the language as a physical carrier of cognitive processes allows access to the non-observable cognitive human world and structures of human consciousness [3, p. 37] and as such, it acts mainly as a peculiar “package” [4, p. 16].

The image constitutes that very package that contains the meaning. According to A.N. Leontiev, the meaning is something that is being uncovered in an object or in a phenomenon objectively and relates to the system of objective interaction of the object with other objects [5, p. 289]. It is the result of the reflection of reality by the consciousness of a certain subject, the former being connected with their professional, social and collective identity.

Throughout the human evolution, men and women have been attributed qualities, psychological characteristics and social roles that have become associated not with certain men and

women but with the categories of masculinity or male features and femininity or female features. These features are specific within the confines of every society and culture.

Within the framework of modern scientific system, this phenomenon impels the necessity to differentiate the biological sex as a physiological component of the individual from the sociocultural gender that is formed on a conventional basis and is a conceptual structure that is represented both on the verbal and non-verbal levels.

As the research conducted by S.I. Dobrova and M.V. Mudraya shows, gender as an ideological construct of conceptual substance is formed on the mental level and consists in manifestation of certain features as male or female attributes [2, p. 158].

As a result of the research of gender image within the framework of cognitive linguistics, certain stages and regularities of conceptual representation of gender images have been identified.

According to the comprehension criterion, I.G. Serova distinguishes three main stages of gender image formation in human consciousness:

- 1) empirical;
- 2) primary;
- 3) secondary [7, p. 147].

Each stage is determined by corresponding conditions:

1. Empirical understanding is determined by the interpreter's gender identity.
2. Primary understanding is determined by the real or imaginary gender identity of the object who is the subject of conceptual comprehension.
3. Secondary understanding is determined by the listener's gender identity.

According to I.G. Serova, the fundamental knowledge of gender is considered as an androcentric episteme of knowledge structure that defines pre-discursive existence of objects in the language and in the discourse [6, p. 385].

The interpreter is the center of image formation because the interpreter evaluates the object, classifies it as male or female and/or evaluates the object from the point of view of a man or a woman, which defines the specifics of parametrization,

According to Ch. Fillmore, the listener or the observer constructs a reasonable hypothesis about the nature of conceptualization that has induced the interpreter to produce an utterance. In other words, the former recognizes the scenes, images or reminiscences that are activated at the moment of message transmission; an individual not just decodes the message but interprets the utterance with the help of active comparison of its traits with the representations kept in the permanent memory [9, p. 138].

At the same time, S.I. Dobrova and M.V. Mudraya point out that the gender image that is fixed in the native speakers' consciousness can be realized in a text through representation of male or female attributive features, which constitutes the contents of gender information [2, p. 193].

The specific features of gender images are determined by cognition experience in the consciousness of a human as part of a certain sociocultural group. Identification of gender image meanings depends on the worldview of the sociocultural group to which the image belongs.

The formation of gender as an ideological construct of conceptual essence occurs at the mental level and consists in manifestation of certain features that are in essence male or female attributes.

The gender image which is fixed in the native speakers' consciousness can be actualized in a text through the representation of attributive male and female features, which constitutes the conceptual meaning of gender information.

Analysis of cognitive mechanisms and linguostylistic forms of gender images representation in American linguoculture constitutes the perspectives to the further research.

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## **ВЛИЯНИЕ КУЛЬТУРЫ СЕРЕБРЯНОГО ВЕКА НА СОВРЕМЕННОЕ ОБЩЕСТВО THE INFLUENCE OF «SILVER AGE» CULTURE ON MODERN SOCIETY**

**Аннотация.** Статья посвящена «Серебряному веку» – значительной эпохи русской культуры и литературы, и ее влиянию на сознание, мысли, мышление современного общества. Дано описание анализируемого периода, отмечены исторические предпосылки его возникновения, проанализирован вклад исследуемого явления в мировую культуру. В статье



проведен анализ статистических данных, полученных на основе опроса, проведенного Всероссийским центром изучения общественного мнения, а также опроса молодёжи в возрасте от 16 до 25 лет, выполненного в рамках научно-исследовательского проекта «Серебряный век и его влияние на современное общество». Опрос проводился среди молодежи г. Ульяновска. Особое внимание уделено примерам становления выдающихся людей современности под влиянием творчества поэтов «Серебряного века». Сделан вывод о влиянии анализируемого периода на развитие современного общества.

**Abstract.** The article is devoted to the “Silver Age” as a significant era of Russian culture and literature, and its influence on the consciousness, thoughts, mentality of modern society. A description of the analyzed period is given, the historical reasons of its beginning are noted, the contribution of the described phenomenon to the world culture is analyzed. The article analyzes the statistical data obtained on the basis of a survey conducted by the A Russian Public Opinion Research Center, as well as a survey among young people aged 16 to 25, carried out within the framework of the research project “The Silver Age and its Impact on Modern Society”. The survey was conducted among the youth of Ulyanovsk. Particular attention is paid to examples of the formation of prominent people of our time under the influence of the poetry of the “Silver Age”. It is concluded that the influence of the analyzed period on the development of modern society is great.

**Ключевые слова:** появление литературы, «Серебряный век», современная молодежь, культурное влияние, статистика.

**Key words:** origin of literature, «Silver Age», modern youth, cultural influence, statistics.

“Silver Age” of Russian culture is considered to be the Russian Renaissance as one of its aims was bringing more humanism to culture. This name was given to the epoch in analogy with the “Golden Age” of Pushkin times. The “Silver Age” begins at the end of the 19<sup>th</sup> and lasts till the beginning of the 20<sup>th</sup> century, thus covering just a short period of about twenty years. The uniqueness of this epoch lies in the borderline situation in Russia, which is so called the conflict of epochs. On the one hand, it seemed that this was the decline of European civilization, the crisis of Christian consciousness, on the other hand it was a moment which opened access to a renewed life and art, the opportunity to reach unprecedented creative heights [3].

And the atmosphere in which people lived became increasingly gloomy and tense, people lived in anticipation of the end of the 19<sup>th</sup> century, as the end of the world, as an imminent catastrophe of an exhausted civilization. But it is precisely thanks to these sentiments that the culture of the “Silver Age” is unusually dramatic, revealing and unique classics of Russian literature (A.M. Gorky, A.P. Chekhov, L.N. Tolstoy, A.I. Kuprin, M.M. Prishvin, I.A. Bunin and the others). Dozens of the best poets wrote their best poems – A.A. Blok, N.S. Gumilev, etc., including very young ones – S.A. Yesenin, A.A. Akhmatova, M.I. Tsvetaeva, I. Severyanin, V.V. Mayakovsky and the others.

Unfortunately, present time people do not pay enough attention to the culture of reading (according to sociologists, the number of regular readers in our country has decreased from 49% to 26% over the past 10 years.), which leads to the general decline of spiritual values [2]. As John Martin once said: “the reader lives a thousand lives before he dies. A person who never reads experiences only one” [5]. And that is why it is necessary to study literature in the age of technology in order to develop imagination, improve memory and broaden outlook. In order to better understand the importance of reading, it is necessary to follow the influence of literature on the modern society.

The “Silver Age” is our country's most significant contribution to the world culture. The intellectual life of Russia at that time was distinguished by its inexperienced saturation, the desire to continue many valuable artistic traditions, to revise the ideological baggage and to update the poetic language, the desire to give a new life to almost all the images and forms developed by universal culture. It is the time of the rise of personality. It revealed in the most contradictory and diverse

spheres of conscious and unconscious: religion, history, revolution, nature. It was the time of the “great synthesis”, when art was thought of as a single whole, with an increasing tendency to be widely interpreted. The ideas of Romanticism in the synthesis of art revived due to the integrity of art forms [3].

The problem of the purpose of art in society and the social mission of the artist was acutely voiced. It provoked the desire for global art transformation. The mentality of the “Silver Age” is the cult of creativity as the only way to break through to new transcendent realities, to overcome the eternal Russian “duality” (holy and beastly). Russian Spiritual Renaissance became the most effective phenomena for Russian philosophy and cultural studies. Russian Renaissance philosophy, the Good and Evil of the world became absolutes.

According to Russian Public Opinion Research Center, on average, a Russian read about 5 books per quarter, and the most reading generation is citizens over 60 years old, rarely or not using the Internet at all. They can even read up to 3 books a month. The respondents aged 35 to 44 years; they manage to read about 2 books a month. Young people aged 18–24 read 5 books per quarter. Young people aged 25–34 read the least in Russia – they manage to read about 4 books per quarter [2].

According to the results of a survey conducted among twenty-five people aged 16 to 25, the following results were received:

- \* read both classical and modern literature (85%).
- \* read and try to write themselves (35%)
- \* prefer modern literature to classical (10%).
- \* do not read at all or less than three books a year (5%).

According to statistics, young people aged 18 to 24 read a lot, but not as much as people over 60, and people aged 25 to 34 read the least. That is why, in order to popularize reading with young people, communities with literature as main theme become more and more common phenomenon in social networks. The Internet is the place where a person spends about 80% of spare time, and it is quite effective to influence through the environment where a person spends a lot of time.

Idols of youth also make a great contribution to the development of reading culture. Young people try to look up to their idols, and if they adore the work of writers of the “Silver Age”, people can also start to be interested in it. For example, in the “Evening Urgant” show, Johnny Depp shared that he loves Russian culture of the last century very much. As the actor noted, he considers Vladimir Mayakovsky his favorite poet. “When I was a child, my older brother taught me to read intellectual books. Reading Mayakovsky at the age of 11–12, I felt a connection with him and with his poetry. This happens to writers you admire” [1]. He compares reading Mayakovsky's poems to an “amazing journey”, and he is delighted to feel the atmosphere and spirit of that epoch.

Another example is Quentin Tarantino's visit. In June 2004, Quentin Tarantino came to the 26th Moscow Film Festival. But, as it turned out, the festival was not the main purpose of the visit to Moscow of the iconic American director. Arriving in Peredelkino, Tarantino went to the cemetery to commemorate famous Russian poet and writer Boris Pasternak. Spiritual contact with the famous author was very important to him. Later in an interview, Tarantino said that he had known Pasternak's poems by heart since childhood and in general Pasternak was his literary idol and influenced his work [4].

The “Silver Age” is an epoch of outstanding talents: artists, writers, poets and philosophers – all these people have made a huge contribution to the development of world culture. This time was indicated by the popularity of new trends in Russian literature and discoveries that changed the world. Nowadays, the creative heritage of the “Silver Age” has not the least influence on the formation of moral and cultural values in modern society. The legacy of this great period resonates in the hearts of millions of people around the world, and these people, inspired by the thoughts and creative ideas of brilliant people, aim to continue what their great predecessors created during an unprecedented cultural upsurge.

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## **РАЗЛИЧИЯ МЕЖДУ МОТИВАЦИЕЙ И ПОТРЕБНОСТЬЮ THE DIFFERENCES BETWEEN MOTIVATION AND NEED**

**Аннотация.** В исследовании автор разделяет понятия «мотивация» и «потребность». Пользуясь научной литературы и прибегая к научным методам исследования (анализ, синтез, дедукция), автор раскрывает генезис понятий «мотивация» и «потребность», их различия,

показывая области их взаимодействия. В исследовании описывается пирамида Маслоу, ее уровни и принцип иерархичного распределения потребностей. В данном исследовании приведены наиболее точные известные категории понятий мотивация и потребность. Все понятия рассматриваются подробно по отдельности для более глубокого изучения смысла данной психологической темы. Автор раскрывает детально каждое из понятий и то какая их роль в жизни людей. В описании исследования автор затрагивает и другие понятия такие как «мотив» для большего понимания выбранной темы. Автор выделяет главные отличительные особенности понятий «мотивация» и «потребность», приходит к выводу о их взаимодействии на основе исследования.

**Abstract.** The survey is devoted to the separation of two main psychological concepts “motivation” and “need”. The scientific methods (analysis, synthesis, deduction) are used for describing the genesis of the concepts of “motivation” and “need”, their differences and the areas of their interaction based on scientific literature. The study describes the Maslow’s hierarchy of needs, its levels and the principle of hierarchical distribution of needs. The most well-known categories the concepts of “motivation” and “need” are specified in this research work. All concepts are detailed separately for a deeper analysis of the meaning of this psychological topic. The author reveals the concepts and their role in people's lives in the smallest details. In the description of the research work, the author describes other concepts such as “motive” for a better understanding of the chosen topic. The author identifies the main distinctive features of the concepts “motivation” and “need”, comes to the conclusion about their interaction on the basis of the research work.

**Ключевые слова:** мотивация, мотив, стимул, потребность, Пирамида Маслоу.

**Key words:** motivation, motive, incentive, need, Maslow's hierarchy of needs.

Any psychological or physiological condition, any change in the body is associated with motivation and needs. Motivation is the motivating basis of a person's mental life, a set of psychological reasons that determine the activity of human behavior. Motivation is divided into two categories: negative and positive. Positive motivation is characterized by the usage of positive incentives. For example, a long-awaited expensive purchase or a dream trip after a hard-working period. Such motivation is the most effective one. The desire to achieve your goal is reinforced by this type of motivation. If the aim is achieved positive emotions appear. On the contrary, negative motivation is based on negative incentives. For example, the desire to purchase something only as the subject of jealousy for others. Negative motivation is based on emotions like fear and envy [4]. Motivation is moved by motives. Motive is the reason of doing something. Motives are formed under the pressure of influence of many incentives, which can be presented in form of objects, actions, opportunities, hopes and etc. However, people have different reactions to the same incentives. That’s why the same incentive can become a motive for different actions.

The concept of motivation is often mixed up with the concept of need.

Need is the essential necessity of something that motivates a person to actions to satisfy it. There are many needs: material, spiritual, social and etc. The world-famous theory which is devoted to the concept of needs is Maslow's hierarchy of needs. Abraham Harold Maslow is an American psychologist. He supposed that human needs are distributed by levels – from the simplest to the highest. The desire to satisfy the higher needs appears when we satisfy the lower ones [3]. His outstanding scientific work “Motivation and Personality” (1954) is referred to the detailed description the levels of needs. Maslow's hierarchy of needs consists of: physiological needs (food, water, warmth), safety needs (security), belongingness and love need (intimate relationship, friends), esteem needs (prestige and feeling of accomplishment), self-fulfillment needs (achieving one’s full potential, including creative activities). According to Maslow’s theory, the aim of human being and behavior

is to reach the fifth level – self-actualization. Self-actualization is the process of full personal potential disclosure.

In conclusion it is necessary to define the main differences between the concepts “motivation” and “need”:

1. The need is not always a conscious desire; motivation is the result of conscious goal-setting;
2. The motivation makes a person imagine the possibility of their future needs and prepare for them in advance;
3. The need provokes a person to have an instant reaction to satisfy his desires [4].

Motivation and needs interact with each other. There would be no motivation without needs. Our physical and emotional conditions are determined by our needs. The motivation makes us achieve the defined goals and self-actualization.

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**КРАТКАЯ ИСТОРИЯ ФРАНЦУЗСКИХ ЗАИМСТВОВАНИЙ  
В АНГЛИЙСКОМ ЯЗЫКЕ  
A BRIEF HISTORY OF FRENCH LOANWORDS IN ENGLISH**

**Аннотация.** Тема заимствования различных слов из одного языка в другой важна и актуальна, так как это – процесс, присущий для каждого языка. Словарный состав современного английского языка содержит достаточно большое количество лексических элементов, происходящих из различных языков мира. Цель данной работы – проанализировать историю французских заимствований в английском языке и определить их место в словарном составе английского языка. Мы попробуем понять, как Нормандское завоевание отразилось на структуре и составе современного английского языка. Проведя краткий анализ истории ассимиляции заимствованных из французского языка слов, мы сможем понять, как они проникли в английское общество, и почему некоторые из них даже смогли заменить слова истинно английского происхождения.

**Abstract.** The topic of borrowing various words from one language to another is important and relevant, as it is a process inherent in every language. The vocabulary of the modern English language contains quite a large number of lexical elements originating from different languages of the world. The aim of this paper is to analyze the history of French borrowings in English and to determine their place in the vocabulary of English. We will try to understand how the Norman Conquest affected the structure and composition of modern English. By briefly analyzing the history of the assimilation of words borrowed from the French language, we will be able to understand how they penetrated English society and why some of them were even able to replace words of true English origin.

**Ключевые слова:** английский язык, французский язык, заимствования, словарный состав, история.

**Key words:** English, French, loanwords, vocabulary, history.

The study of the history of any of the world languages, including English, cannot be complete without studying the history of the origin and development of the vocabulary, which is understood as all the words available in that language.

“The vocabulary of a language, which includes all the words of the language, is not homogeneous in its origin and in the time of appearance of individual words” [2, p. 98]. Almost every language, and especially English, as the most widespread language of our entire planet, has a huge number of words borrowed from other languages. This work is devoted to the study of words borrowed from French into English.

N. N. Amosova [1, p. 99] notes that Latin, Scandinavian and French were the main sources of English language formation. The first language to come into English was Latin, the second was

Scandinavian. The third and biggest source, which gave an enormous amount of foreign words to the English vocabulary, was French.

V.P. Sekirin [4, p. 42] suggests in his work, that French influence on English was not sudden, it started before the Norman Conquest of England, and was especially strengthened by King Edward in the first half of XI century. At the end of the 10th century there were quite strong commercial and cultural relations between the two countries, England and France.

In 1066 one of the most important events in the history of the English nation occurred. William, duke of Normandy, a large independent region in northern France, took advantage of the palace troubles that began in England after the death of Edward, England's childless king, and crossed the Channel with an army. At the Battle of Hastings, the English army was defeated and all but wiped out. King Harold, who commanded it, was killed. William, nicknamed 'the Conqueror', marched on to London, where he was proclaimed King of England (1066–1087). Normandy became part of the English state.

"Although the influence of French borrowings on the English vocabulary is undoubtedly great, it did not cause the transformation of the entire English language, as the latter changed gradually, preserving the characteristic features of grammar, vocabulary and sound structure over a long period" [4, p. 43].

According to Ivanova I.P. and Belyaeva T.M. [3, p. 98] the Norman Conquest was not only a great event in the history of England, but also the greatest event in the history of the language.

The English conquerors spoke a northern dialect of French, and for nearly 300 years French was the official language of power. It was used in the army, the courts, and the church. It was spoken by the nobility and by urban dwellers in the South. French, along with Latin, was the language in which children wrote in school. Moreover, pupils translated texts from Latin into French, not into their native English. In spite of all this, England never ceased to be an English-speaking country and all the lower classes, who made up a large part of society, spoke only English. And since most of the population was illiterate, English was used as a language of oral communication.

"In the beginning, the two languages existed apart, not touching each other. But after a while, a slow process of blending began" [3, p. 100].

"In 1258 King Henry III of England (1207–1272) addressed a bilingual proclamation in French and English, evidently thinking that French would not be enough for understanding the text of the proclamation" [2, p. 108]. The Norman barons and French townspeople began to use words from English to be understood by the locals, while at the same time the English began to use French words in their speech.

Such conditions could not remain in place for long, and the struggle between the two languages ended in the victory of English as the common language of communication between people in England; French was pushed aside and restricted to certain areas of society, while continuing to be used in writing. By the fourteenth century the dominance of French had ended, and English had become the language of government and writing.

According to Sekirin, French had a rather large impact on the vocabulary of English after the Norman Conquest. The number of French words in the English vocabulary far exceeds borrowings from other languages.

From the seventeenth century onwards, another gradual transition of French words into English began, mainly with writing, thanks to great writers, and the works of scholars and philosophers. Initially, the loanwords were simple and short. In some cases, they were nouns and verbs of the same form, and many words have fitted into English so well that no one even thinks that they actually belonged to French, so much so that they have taken root and fitted into the vocabulary of English. To take just a few words that many people are familiar with as an example: age, air, brush, car, case, change, clear, close.

"Most foreign scholars divide French borrowings on a semantic basis, that is, they classify them into certain classes depending on which field of activity they belong to. In foreign linguistics French elements are also considered on the basis of morphological features, i.e. they are divided by parts of speech" [4, p. 46].

Starting from the Norman Conquest in 1066 and up to the 16th century, French borrowings poured into English language in a powerful stream. The English vocabulary is enriched with words from different thematic areas, reflecting the peculiarities of British life at that time. For example, French words such as country, valley, river, border etc. appear to describe the country. A fairly large group of words is associated with the names of social relations. There are few original English words in the thematic group; they are king, queen, earl, lord and lady. Borrowed words are emperor, baron, count, dame, damsel etc., they represent new concepts that entered British life. The new rulers of Britain are Normans, and this is reflected in the presence of French loanwords in the “government” thematic group: sovereign, crown, administration, parliament, guardian, reign, etc. This was reflected in the presence of French borrowings from the ‘government of the country’ thematic group: sovereign, crown, administration, parliament, guardian, reign, etc. It was joined by jurisprudence, which greatly enriched its vocabulary with Norman words: justice, crime, plaintiff, evidence, dungeon, etc., as well as military vocabulary: war, navy, peace, captain, admiral, victory, conquer, etc. [5, p. 83].

In the 12th–16th centuries, French borrowings came mainly with religious notions, as well as in connection with the spread of French fashion, cuisine and crafts: chastity, innocence, devotion; barber, butcher, merchant, coin; garment, cotton, towel; fry, boil, mutton, cabbage.

In the XVII century, most French loanwords are industrial and commercial terms: capital, commerce, insurance, bank, machine, investment, etc. In the XVIII century, political terms of the French Revolution are added: aristocrat, democracy, despot, section and so on. Later the stream of borrowings from French is gradually drying up; the English language already includes single words of different thematic groups (garage, chauffeur, development, fiancée, etc.).

Interestingly, all animal names are native English words and the meat of these animals is a French loanword, e.g. cow – beef, pig – pork, deer – venison, sheep – mutton.

French words in English are used, as a rule, to achieve a more official formality, e.g.: commence instead of begin, to be content instead of to be glad.

The above words (and the commonly used ones such as: composition, continue, etc.), being French loanwords, are pronounced in English.

Looking at French borrowings from the point of view of assimilation allows us to see that the English language did not perceive borrowed words passively. There was a constant process of selection of words that penetrated from the French language. The English language fully absorbed only those words which turned out to be necessary and useful, crowding out those which, being superfluous, did not contribute to the enrichment of the language.

It should be noted that loanwords have a different impact on vocabulary enrichment in different languages. In some languages, they have not had such an impact that they may have had a significant effect on the vocabulary composition of the language. In other languages borrowing at different historical periods had such a significant impact on the vocabulary of the language that even service words, such as pronouns, prepositions, borrowed from other languages, displaced the native service words.

As a result of close and constant contact between the two languages, the vocabulary of the English language absorbed a huge number of words from French, most of which still exist in it today, some of which have come into maximum usage, some remained within the bookish style, others have become archaisms.

Thus, we may note that borrowed vocabulary occupies a considerable place in the lexical system of the English language. In order to study the peculiarities of its functioning within a specific linguistic system, it is advisable to pay considerable attention to the specifics of the arrival of this vocabulary into the language and the study of the conditions that conditioned the arrival of these borrowings.

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## **РОЛЬ ХУДОЖЕСТВЕННОЙ КАРТИНЫ ЭПОХИ В ФОРМИРОВАНИИ ИНДИВИДУАЛЬНОЙ КАРТИНЫ МИРА АВТОРА**

## **THE ROLE OF THE ARTISTIC WORLDVIEW OF THE EPOCH IN THE FORMATION OF THE AUTHOR'S INDIVIDUAL WORLDVIEW**

**Аннотация.** Статья освещает проблему исследования понятия «картина мира» в целом, и в частности понятия «художественная картина мира». В статье анализируются разные подходы к пониманию «картины мира», объясняются предпосылки возникновения художественной картины мира, приводятся её основные характеристики. Художественная картина мира рассматривается в статье как элемент непосредственно, участвующий в формировании индивидуальной картины мира художника – автора произведения искусства. Цель данного исследования – проанализировать роль художественной картины мира в формировании индивидуальной картины мира художника. В результате проведённого

исследования были сделаны выводы о том, что очевидно взаимовлияние и взаимосвязь между обозначенными картинами мира, а также доказано, что художественная картина эпохи, в которой жил тот или иной автор, меняет мировосприятие художника и проявляется во всех его произведениях искусства.

**Abstract.** The article covers the problem of studying of “worldview” in general, and in particular the concept of “artistic worldview”. The article analyzes different approaches to understanding the “worldview”, explains the preconditions for the emergence of an artistic worldview and provides its main characteristics. The artistic worldview is considered as an element directly participating in the formation of an individual worldview of the artist – the author of the work of art. The purpose of this study is to analyze the role of the artistic worldview in the formation of the artist's individual worldview. As a result of this study, it was concluded that the influence and relationship between the artistic worldview and the individual worldview of the artist is obvious, and it was also proved that the artistic worldview of the era in which this or that author lived, changes the artist's worldview and is manifested in all his works of art.

**Ключевые слова:** картина мира, художественная картина мира, индивидуальная картина мира художника, эпоха, антропоцентричность.

**Key words:** worldview, artistic worldview, artist's individual world, era, anthropocentricity.

The problems of interaction and relationship of a person, thinking and reality are relevant in modern humane studies. In this regard, the concept of “world view” is of scientific interest for modern scientists.

This article highlights the problem of studying the author's, individual worldview, as an integral element of the artistic worldview of the era. The purpose of the article is to analyze the role of the artistic worldview in the formation of the artist's individual worldview. The relevance of this study lays in the fact that individuality and the author's worldview within the framework of the artistic worldview is of scientific interest in modern social and human sciences.

The concept of “worldview” has been discussed since the 30-s of the last century (G.D. Gachev, A.Y. Gurevich, T.F. Kuznetsova, Yu.M. Lotman, V.N. Mikhailovsky, B.S. Meilakh, B.A. Serebrennikov, N.P. Skurtu, L. Wittgenstein, W. Kottak, M. Heidegger, I. Huizinga and others).

“Worldview” is a broad concept that actively functions in such areas of knowledge as philosophy, psychology, cultural studies, linguistics, ethics, etc. Worldview, as a universal category of integral perception of the world, includes such components as linguistic, social, scientific, religious and artistic picture of the world.

The issue of distinction of the worldview, as a form of scientific idealization of the philosophical and cultural reconstruction of culture, and the worldview, because of the real general cultural state of public consciousness, is one of the most relevant problems in modern cultural studies and philosophy. From the point of view of the first approach, the worldview is a model of a real concrete historical epoch, reflecting all the essential characteristics of social life. The second approach to the study of this issue defines the worldview as the world considered as a picture.

It is undeniable that in the process of changing historical eras and value systems, one worldview is replaced by another. The antique worldview is being replaced by the medieval one, and that is being replaced by the worldview of the New time. Each picture of the world has characteristic features and features inherent only to it, however, with a more detailed study, elements of their similarity become obvious.

V.I. Postovalova notes: “The worldview is not a mirror image of the world and not an open “window” into the world, but a picture, that is interpretation, an act of world understanding, and it depends on the prism through which the worldview is made. It is global image of the world, which is the result of all the spiritual activity of a human” [5, p. 18].

Summing up the results of the analysis of the typologies of worldviews, we can make a generalizing conclusion that modern humanities distinguish religious, social, artistic and scientific worldviews. Each of the above views of the world is associated with a certain sphere of human existence; each is associated with the solution of a certain range of problems. Often these problems coincide, overlap. Such a classification of worldviews is undoubtedly artificially created and serves solely for the convenience of solving any scientific issues and tasks. It seems to us possible to use the principle of logical differentiation in creating a similar typology of the worldviews presented at the present time.

In our work, we adhere to the classification developed by M.D. Akhundov. The scientist identifies the following types of worldview: 1) a worldview as a representation of the multiplicity of times in a multi-level world (a mythological worldview); 2) a worldview as a system of views based on the existence of a single space and a single time; 3) a worldview as a representation of a single space-time, which is implemented in the logical-mathematical model of the theory of relativity [1, p. 121]. Akhundov distinguishes the scientific worldview (social and scientific worldview) and the extra-scientific worldview (religious, artistic and partly linguistic). The position of the linguistic worldview in this typology is ambiguous. On the one hand, linguistics, considering the linguistic worldview, is an exact science rather than an art. On the other hand, it is indisputable that there is a close connection between the language and culture of a particular people, as well as the mandatory entry of issues of the linguistic worldview into the sphere of other areas of human knowledge.

Every worldview is based on certain knowledge, generalizations and synthesis of various ideas about the surrounding reality, corresponding to a certain historical epoch. The results of a person's cognitive activity add up to a certain set of knowledge, and those, in turn, form a worldview. Different worldviews form a vision of reality based on their own, specific worldview positions. However, the greatest development of ideas about the surrounding reality is achieved by scientific research. Consequently, the scientific worldview can be considered the most progressive and has the maximum influence on other worldviews.

The concept of “artistic worldview” has been widely used in philosophical, cultural, art history, psychological, pedagogical and other sciences for several decades. However, there is still no single precise definition of this term. It should also be noted that in a number of works by researchers of the artistic worldview, one could often find concepts similar in content and scope to the main generally accepted term: “artistic image of the world”, “artistic model of the world”, “artistic reality”.

The origin of the artistic worldview is associated with the appearance of the contradictions between science and art at the turn of the 19th–20th centuries. The artistic worldview appears in the form of an artistic image, reflecting the artist's vision and understanding of humanity and existence. This approach to studying the worldview is associated with the names of J. Burckhardt, M. Weber, K. Lamprecht, V.G. Ril, J. Heizingi.

In their works, the worldview is a prerequisite and hermeneutical element of recreating a complete view of history, epoch, as well as of a personality. As an integrative concept of such completeness, there is a category that performs the role of a cultural and historical universal. J. Burckhardt calls “individualism”, the idea of a person, “what he is and what he always should be”, such a universal. According to the scientist's point of view spiritual values are higher than material values, the value of art is higher than scientific “philosophical reflection” [2, p. 101]. In his cultural concept I. Kant calls the highest manifestation of culture its historical manifestation. An integrative idea in the works of V.G. Riel is the concept of “character-portrait of an epoch”. K. Lamprecht considers that the integrative idea is a “collective psyche”, the unity of socio-psychological factors in culture.

An artistic worldview can be defined as a set of images created at a specific historical moment by a certain group of people, historical events, an individual author, affecting all spheres of human activity and reflecting the laws of human existence, as well as determining the spiritual dominants of being.

The epoch through the language of its culture acquires colors, mobility of forms, a plastic image. To create such an image, any artist is influenced by the necessity to display an artistic

worldview that visualizes such image. In the work "About the Spiritual in Art" V.V. Kandinsky points to three factors that control the artist's consciousness when he creates an image of the epoch in his works: 1) the artist "must productively use the talent given to him, 2) his actions, thoughts and feelings, like any other person, form a spiritual atmosphere, purifying or infecting the environment, and 3) actions, thoughts and feelings are the material for his creations, which, in turn, affect the spiritual atmosphere" [3, p. 103].

In our opinion, human needs for self-expression can be considered the leading moment in building an artistic worldview. Spirituality as a concrete historically embodied subjectivity is an integral factor in the construction of an artistic worldview.

An individual worldview is a reflection of the world in a person's consciousness through the prism of his individuality. E. Mach pointed out: "Not only humanity, but also every person finds in himself, once awakened to full consciousness, a ready-made worldview, in the formation of which he did not participate. He receives it as a gift from nature and culture" [4, p. 13]. The formation of an individual's worldview is influenced by all other worldviews (scientific, social, religious, linguistic, artistic, etc.). Consequently, the construction of the image of the world in the mind of a single person depends on his age, gender, ethnicity, profession, language, individual characteristics and personality traits, preferences and hobbies, spending free time, etc.

Individual pictures of the world of individual artists are reflected in the artistic worldview of the epoch as a whole, in turn, the artistic worldview of the epoch certainly has a huge influence on the formation of ideological and stylistic views of each author.

As a result of a person's interaction with the surrounding world, his own idea of the surrounding reality is formed, his model of the world is formed. One of the central concepts in the study of an individual worldview is "belief system" as an integral component of the artist's worldview. There are different points of view about the role and participation of the system of beliefs in building a worldview. Some researchers consider a picture or image of the world is the result of a reflection of reality and an expression of the artist's worldview. Others say that the image of the world is formed only from the individual thinking of the author. Researcher A.A. Kovalev, describing the process of the emergence of the artistic worldview and the worldview as a whole, builds the following sequential chain: the formation of the "image of representation", the creation of the "image of the work", the design of the "image of impression".

An important role in building an individual worldview is played by anthropocentricity, as an integral principle of human consciousness to measure and evaluate all phenomena of the surrounding reality in its image and likeness.

"The author worldview is an element of the global artistic worldview, which arises in the reader's mind when perceiving a work of art and represents a synthetic panoramic representation of concrete reality in various spatial and temporal ranges recreated by all types of art". The sensual, visible and emotionally colored artistic worldview of each epoch finds embodiment in various works of art. Each epoch reflects in general a certain general level of artistic thinking [7, p. 40].

Each artist is under constant pressure of a certain cultural space, that affects the specifics of his understanding of the essence of things, the formation of an individual worldview – a worldview model. A unique language of culture – the language of signs, images and symbols – becomes a universal way of cognizing the surrounding reality for a person, in particular for a creative personality.

The task of any artist is to convey to the recipient the meaning and purpose of creating a work of art, as well as to express their desire to make the reality around them more attractive, decorate the world around them, bring them to perfection, get closer to the ideal. A work of art always carries a deep meaning, even if it is not always obvious and understandable. A work of art conveys an understanding of life, an individual picture of the author's world. It always bears the imprint of the author's personality. The meaning contained in the work of art is transmitted to the recipient not directly, but indirectly – symbolically.

A work of art, in particular fine art, is a system of images-symbols selected by the author and reflecting his individual worldview. On the other hand, the symbol is the main building unit of the entire artistic worldview of the epoch. Consequently, the individual artist's worldview simultaneously

bears the imprint of the artistic worldview of the epoch and is reflected in it, and the connecting link in this chain is a symbol. The work of art, the impact on the recipients, consciously or unconsciously, makes them experience the feelings and emotions that are embedded in them by the author. The image created by the artist is visualized in the symbol.

In the broadest sense, a symbol is “a concept that captures the ability of material things, events, and sensory images to express ideal contents other than their direct sensory-bodily existence” [6, p. 614]. The symbol has a symbolic nature and, therefore, all the properties of the sign are inherent in it (the material shell; the designated object; the rules of interpretation established by man). However, unlike a sign, a symbol is not a simple indication that it is itself. “A symbol is an independent, self-valuable discovery of reality, in the sense and power of which, unlike a sign, it participates” [6, p. 614].

In the artistic worldview a symbol is defined as a juxtaposition of an object image and its deep meaning. The symbol contains a meaning, where the primary, direct meaning means along with this another, secondary, allegorical meaning, the understanding of which is possible only through the first.

Various factors influence on the formation of an individual human worldview in general, and the artist's worldview in particular. One of the main factors can be considered an artistic worldview of the epoch, forming a special understanding and vision of the surrounding reality, inherent only in this epoch.

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**ЯЗЫКОВЫЕ РЕСУРСЫ ГЕНДЕРНОГО ПОЗИЦИОНИРОВАНИЯ СУБЪЕКТА  
ЛИЧНЫХ ВОСПОМИНАНИЙ В ИНТЕРНЕТ-КОММУНИКАЦИИ  
LANGUAGE RESOURCES AS GENDER MARKERS IN INTERNET-BASED  
AUTOBIOGRAPHICAL MEMORY REPORTS**

**Аннотация.** В фокусе данного исследования гендерная специфика вербализации воспоминаний в онлайн-коммуникации. В работе ставится цель изучить, как различается вербальное представление мужских и женских воспоминаний, и выявить языковые ресурсы, используемые при объективации мужских и женских воспоминаний. Анализ фактического материала осуществлялся в несколько этапов, на каждом из которых использовались цифровые и традиционные методы исследования (метод контекстуального анализа и элементы статистического анализа). Полученные результаты позволяют сделать вывод о том, что в текстах личных воспоминаний гендерные маркеры проявляются на лексическом, грамматическом и коммуникативном уровнях. Маркерами мужского гендера выступают глаголы активной семантики, монотемпоральный план прошедшего и простые синтаксические конструкции, тогда как женский гендер маркирован статичными глаголами, предпочтением плана настоящего и более сложными синтаксическими конструкциями. Результаты проведенного исследования позволяют заключить, что при вербализации личных воспоминаний в Интернет-коммуникации имеет место гендерная вариативность, проявляющаяся как на структурном, так и на содержательном уровне высказывания.

**Abstract.** The research focuses on language features of verbalizing memory reports in online communication. This study is an attempt to investigate how representation of male and female memories differs on the verbal level. The goal of the paper is to identify language resources of manifesting male and female memories and analyze gender-specific features of online recollections. The analysis of the empirical data was conducted in several stages, a combination of digital and conventional methods being employed in each step. The obtained results allow concluding that male and female memory reports are marked for gender lexically, grammatically and on the communicative level. Male memory reports are characterized by simpler syntactic structures, stricter narration structure and less emotional language. Female memory reports use complex syntactic constructions, story-telling patterns, and more emotional language. A critical analysis of memory reports shows that gender differences between male and female memories are more explicit on the lexical and morphological levels and less explicit on the syntactic and communicative levels.

**Ключевые слова:** гендер, воспоминания, онлайн-дневники, Интернет-коммуникация.

**Key words:** gender, memories, online diaries, Internet-based communication.

The first two decades of the 21<sup>st</sup> century were a period of intensive development of gender studies in Russian linguistics. At the moment, it is possible to identify several key areas in this field

of research: gender manifestation in verbal and nonverbal communication, gender representation on different language levels, gender representation in various types of discourse.

This research is conducted within the framework of the cognitive-discursive paradigm advanced in [5; 6] and devoted to the peculiarities of gender-marked texts of personal memories circulating in the space of Internet communication. Representatives of various research fields are currently addressing gender issues, the relationship between gender and language being one of the topics under examination. In the works of Russian and foreign linguists, it is customary to distinguish two categories of gender: male and female [2; 1]. In this study, the above-mentioned typology is adopted and an attempt is made to analyze the specifics of gender self-positioning of the Reminiscing Subject verbalizing his or her personal memories in public online diaries.

The research is relevant for the development of interdisciplinary studies of language in its connection with the cognitive activity, the functional importance of memory as a system of processing personal experience, and the need to study linguistic objectification of mnemonic processes and states of the subject under various communicative and discursive conditions.

The goal of the paper is to identify language resources employed in marking male and female memories and analyze gender-specific features of online recollections.

The study is based on 3,797 diary entries available online on the MyDiary platform (<https://www.my-diary.org/hl/en>). In the course of the study, the following methods and techniques were used: the method of observation with subsequent analysis and generalization of the results, the method of contextual analysis, elements of the statistical method, as well as the method of automated text processing, including semantic, morphological and sentiment analysis.

The research gives a review of present-day language-related gender studies, presents approaches to gender applied by Russian and foreign linguists, examines the traditional methodology of gender studies in linguistics and explores possibilities of applying digital methods when analyzing diaries. The study reveals that English online diaries often function as texts representing the mnemonic experience of the Subject of Internet communication. The research focuses on gender in online memories at the lexical, grammatical and communicative levels, and offers results of sentiment-analysis of gender-marked online diaries.

The study revealed that in texts written by women, the author's personal experiences, social interaction and personal relationships are more common. It was also noted that it is more typical for women to initiate a conversation. A call for attention can also be traced in the lexical means employed by authors: women are more likely to give a negative emotional assessment of past experiences, while representatives of the male gender, in general, are more restrained in their assessments. This conclusion was made on the basis of the fact that in texts of female authors, appeals to readers and rhetorical questions, a mild expression of will and an appeal to well-known images are more common.

The discursive reflection of reality in personal diaries presupposes the influence of a personal worldview and a sense of the situation. The object of the records, more often referred to as “male” or “female”, determines the logic and structure of the narrative, as well as positioning of women as more domestic and caring, and men as more militant and hardworking [4]. However, in the modern environment, the rigid distribution of responsibilities and gender attachment to the type of behavior is not so rigidly traced, which leads to a balance of activities and gender roles.

Verbal resources were analyzed on the lexical, morphological, syntactic and communicative levels. The choice of parameters for analysis was based on previous research [7; 2; 8; 3]. On the lexical level, the dominant content, style features and references to situations were taken into consideration. On the morphological level verb tenses and modality were analyzed. On the communicative level the sentiment tone of online diaries was analyzed genderwise. Sentiment assessment of each entry of the collected corpus was performed with SentiStrength, an automatic sentiment analyzer tool working with web texts.

In the course of the work, general tendencies of self-presentation for female and male gender representatives in personal memories at the morphological level were also revealed. In the conditions of the modern Internet and real-time existence, the fixation of memories occurs almost simultaneously with the event, which is expressed in the more frequent use of verbs of the Present Simple group. One

of the key differences is the monotemporality of men's texts, which makes it possible to define their memory as "fixing events", while the reproduction of past events in women is perceived as a "process". Thus, in the recordings of women, the times of the group Perfect and Continuous are more common.

The results demonstrate that male and female memory accounts are marked for gender lexically, grammatically, structurally and emotionally. Male memory reports are characterized by simpler syntactic structures, stricter pattern of narration and lower emotionality. Female memory reports show complex syntactic constructions, intricate story-telling patterns, and more emotional language.

The investigation revealed that gender differences in representing memories online manifest themselves both on the verbal and multimodal levels (that is, verbal features in combination with visual elements). The nonverbal level was represented by visual code elements, such as photo images and avatars. The data showed that female memory accounts (23%) were more likely to include avatars and photos than male accounts (10%).

The findings reveal that differences in the structure and functions of autobiographical memory described in psychological literature manifest themselves on the language level as well. The results demonstrate that male and female memory accounts are marked for gender lexically, grammatically, structurally and emotionally. Male memory reports are characterized by simpler syntactic structures, stricter pattern of narration and lower emotionality. Female memory reports show complex syntactic constructions, intricate story-telling patterns, and more emotional language.

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## **ПОНЯТИЕ И РОЛЬ ЮРИДИЧЕСКОГО ПЕРЕВОДА CONCEPT AND ROLE OF LEGAL TRANSLATION**

**Аннотация.** Данная научная работа представляет собой освещение особенностей юридического перевода, его целей и способов. Рассматриваются исторические аспекты перевода юридических терминов, их образование и специфика. Выделены следующие основные направления исследований в области языка и права в науке: общение в суде, правовая аргументация, судебная лингвистика, лингвистические нормы в юриспруденции, юридическая сила языковых действий. Также раскрыты особенности юридического языка, критикуемые лингвистами, а именно: использование слов естественного языка, использование «неопределенных выражений», архаизмы, «компактный стиль».

**Abstract.** This scientific work is an illumination of the features of legal translation, its goals and methods. The historical aspects of the translation of legal terms, their formation and specificity are considered. The following main directions of research in the field of language and law in science are highlighted: communication in court, legal argumentation, forensic linguistics, linguistic norms in jurisprudence, legal force of linguistic actions. It also reveals the features of the legal language criticized by linguists, namely: the use of natural language words, the use of “indefinite expressions”, archaisms, “compact style”.

**Ключевые слова:** юридический перевод, термины, переводчики, тексты, судебная лексика, юридический текст.

**Key words:** legal translation, terms, translators, texts, vocabulary of law, legal text.

Translation is a very complex and versatile activity that has existed since ancient times. The difference in languages became the main reason for the emergence of difficult, but much needed work, which to this day serves the purposes of communication and the exchange of spiritual values between peoples. The translation is understood the replacement of one language; however, this is not at all the case. Translation is a creative process that requires tremendous effort and knowledge in various spheres of life. Undoubtedly, people turn to translation in order to separate the linguistic and linguo-ethnic barrier, since in translation different cultures, different personalities, different

mentality, different traditions and attitudes come into contact with each other. Thanks to it, information and communication with foreign countries became available.

When translating legal texts, the translator is required to maximize accuracy and completeness of transferring the content, which means that not a single word of the original should be missed, including, of course, the terms that must be found unambiguously in the target language [2, p. 263].

The purpose of legal translation: the development of translation competencies that provide the opportunity for students to perform adequate (full) translation of written and oral legal texts from the studied foreign language into Russian and from Russian into a foreign order [1, p. 378].

Translation covers a wide range of activities. He can speak both in writing – translation of poems, fiction, business papers, articles and speeches of politicians, science and culture, newspaper journalism, religious texts, and orally, for example, translation of a speaker's speech during a press conference, negotiations, a business meeting with the purpose of overcoming the language barrier in the case when communicants speak different languages. At the present stage of development of civilization, a person seeks to quickly enrich himself with information, which is what the translation process is aimed at. Thus, we can conclude that the informative function of translation is one of the most important.

At all times, translation contributed to the formation of the highest stage in the development of civilization: “in antiquity, it contributed to the continuity of Greek and Roman cultures, in the Middle Ages – the spread of Christianity, in all subsequent centuries, the mutual enrichment of art, science, literature, material and everyday culture of various peoples of the world.

In our time, translation activity in all its varieties has acquired an unprecedented scale in connection with the growing intensity of international contacts, which gives us reason to call the XXI century “the century of translation”.

Different types of texts are translated, which may differ in terms of both linguistic uniqueness and universality. For example, a characteristic feature of scientific texts is the wide use of terminological vocabulary, while the lexical background of the rest of the vocabulary is neutral, impersonal, vaguely personal sentences, compound words, and the present tense prevails. Musicological, i.e. dedicated to the theory and history of music, musical creativity, the text is somewhat archaic, gives the impression of sublime, tk. replete with “outdated words, archaic inversions, emotionally colored words (“magnificent”, “virtuoso”, “excellent”)” [3, p. 139].

Language and law are considered in the scientific literature through a branch of science called “legal linguistics”. German linguist Adalbert Podlech called “legal linguistics” the totality of all methods and research results that relate to the issues of the relationship between language and legal norms and meet the requirements of modern linguistics. The modern understanding of legal linguistics has expanded significantly, since “the requirements of modern linguistics have changed, which has come a long way of development over the years.”

In this regard, the ratio of jurisprudence and linguistics in the study of linguistic problems in the legal field has changed, and the role of linguistic research in this area has increased significantly. “The Heidelberg Legal Linguistics Research Group defines this area of research as” the scientific-theoretical and everyday-practical area of contact between the methodological perception of language in jurisprudence and the linguistic analysis of language in the sense of practical semantics.

Based on the classification of the research group for the study of the language of law of the Berlin-Brandenburg Academy of Sciences, the following main areas of research in the field of language and law in science can be distinguished:

1. Communication in court – linguistic behavior of the parties in court. This broad area of research includes, in particular, issues of rhetoric, stylistics, linguistics of the text, as well as various purely linguistic aspects, for example, social and dialectal differences in the linguistic behavior of participants in communication;

2. Legal argumentation – ways and possibilities of expressing legal arguments “by means of natural language, taking into account its ambiguity, variability and uncertainty.” Thus, legal logic is viewed through the prism of the possibilities and properties of the language;

3. Forensic linguistics — the study and development in legal practice of technical methods of investigation using linguistics, etc.;

4. Linguistic norms in the law – “legal prescriptions for appearing in court, requirements for legal translations, issues of linguistic designations, for example, in the field of the right to a name, the right to trademarks, etc.;

5. The legal force of linguistic actions – the validity of laws and legal norms, “types of their language labeling”, as well as special cases of linguistic actions, for example, “criteria of injectivity”, etc.;

There are different opinions on how the language of law can be considered uniform. This assumption is supported by the fact that lawyers, that is, the main speakers of this language, receive the same education on the basis of a single language.

The argument against this statement can be various criteria according to which the language of law can be structured. These are the differences between legal institutions, in which the language of law is a means of communication, and different levels of knowledge and competencies of members of this community.

Among the features of the legal language that are most often criticized by linguists, many researchers cite the following:

- the use of legal terms that coincide with the words of a natural language (for example, “terminological words”: possession (possession, possession), item (thing, object);
- the use of “indefinite expressions” (public interest (interests of the public);
- the use of archaisms;
- “compact style (complex nominal groups, passive constructions, confusing syntactic constructions”.

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## **ГЛАВНЫЕ ЦЕННОСТИ СОВРЕМЕННОЙ ИСПАНСКОЙ КУЛЬТУРЫ** **THE MAIN VALUES OF MODERN SPANISH CULTURE**

**Аннотация.** Эта статья раскрывает тему современных испанских ценностей. Испания является одной из стран, обладающих наибольшим культурным наследием и чьи ценности сегодня проявляются в их повседневной жизни, что безусловно привлекает внимание многих культурологов – испановедов. Исследование основано на статьях новостного портала «El Mundo», где освещаются самые широкие и интересные для населения темы. Также был использован документальный фильм В. Познера о Испании «В поисках Дон Кихота», в котором раскрываются особенности жизни и мышления испанцев. В статье описывается не только роль ценностей на культурном уровне, но и затрагивает все другие сферы жизни испанского общества. Его музыка, его язык и люди, которые продвигают испанскую культуру по всему миру.

**Abstract.** This article studies modern Spanish values. Spain is one of the countries with the greatest cultural heritage and whose values are still manifested in them daily life, which certainly attracts the attention of many cultural Spanish scholars. The research is based on the articles of the news portal “El Mundo”, where the broadest and most interesting topics for the population are covered. The documentary film by V. Pozner about Spain “In search of Don Quixote” was also used, which reveals the peculiarities of the life and thinking of Spaniards. The article describes the role of values at the cultural level, and how they affect all other spheres of life of Spanish society. Their music, their language and the people who promote Spanish culture around the world.

**Ключевые слова:** культурные ценности, культура, новости, литература, политика, музыка, язык.

**Key words:** cultural values, culture, news, literature, politics, music, language.

España ha recorrido un largo y espinoso camino para convertirse en lo que es ahora. Esto se aplica no solo a su política, economía, sino también a los valores culturales y espirituales que los españoles intentan preservar desde tiempos inmemoriales.

El amor por su pueblo, la música y su historia se remonta a las noticias españolas e incluso a las obras artísticas.

La imagen del pueblo a los ojos de los españoles se puede rastrear en la bastante conocida obra literaria “Don Quijote”.

Hay algo de Don Quijote en todos los españoles: aventureros, idealistas y un poco locos en el buen sentido. Un ejemplo de esto es la serie documental de Vladímir Pósner, publicada en 2017 en la televisión rusa, que se llama “En Busca de Don Quijote”, que cuenta la cultura y la historia de España y sus regiones, durante la cual los presentadores recurren repetidamente a la imagen eterna. La serie

documental muestra un momento que revela uno de los valores fundamentales de la cultura española: su literatura y carácter [2].

En 2016 se presentó en el Parlamento español una producción teatral con motivo del 400 aniversario de la muerte de Miguel de Cervantes, donde estuvieron presentes todos los personajes de sus obras inmortales y él mismo. Al final de esta sesión, Cervantes pronuncia la frase «Ustedes y yo saldremos de la sala por las puertas principales que solo se abren ante el Rey cuando sale del Parlamento. Disfrute de este momento, hoy la Cultura sale por las puertas principales» [1; 5]. En esta frase, el Señor Cervantes señaló no solo la cultura como Patrimonio del pasado, sino también la cultura como impulso al futuro, porque los valores cambiantes del español del futuro dependen del español de la modernidad.

Sin embargo, el amor por su cultura se puede observar no solo en la especial atención de los españoles al Patrimonio literario, sino también en el ámbito político. Todos conocemos la situación actual con Cataluña, que a principios del siglo 19 intentó separarse de toda España y demostrar su singularidad e independencia. “Cataluña es el nuevo estado de Europa” [6]. Este evento masivo sufrió un enorme aumento de disturbios civiles. La gente comenzó a gritar más que nunca sobre su gran nación y cultura.

En este sentido, ya hoy los políticos españoles están tratando de cumplir con las expectativas de los ciudadanos y están desarrollando, y haciendo realidad, varios proyectos para proteger la cultura española. Por ejemplo, el 1 de octubre de 2021 El presidente del Gobierno, Pedro Sánchez, anunció: “Hoy el Consejo de Ministros va a aprobar un Proyecto Estratégico en las próximas semanas con el objetivo de generar oportunidades de negocio teniendo como base la lengua española. Se llamará El español, valle de la lengua y con él quiere aprovechar el potencial del idioma en multitud de campos como la tecnología, el turismo o la industria” [3].

Este programa indica el deseo de los políticos de fortalecer su idioma, y al mismo tiempo su cultura, en el escenario mundial. Pero tratan de mantener no solo el Castellano como lengua principal, sino también todas las demás lenguas constitucionales. “Se suele hablar de la riqueza de nuestras lenguas y qué puedo decir yo aquí en Galicia, por supuesto que sí, de las cuatro lenguas cooficiales reconocidas en nuestra constitución y es un acierto porque atesoramos cuatro lenguas que hacen de España un país único, grande y rico», ha alegado el jefe del Ejecutivo español” [3]. Aquí se manifiesta otro valor del pueblo español: su idioma. Están listos para luchar por él hasta el final y allanar su camino hacia el futuro y el mundo entero.

Pero ¿qué es España sin música? Los españoles se enorgullecen y honran profundamente su música. Y no se trata solo de música ágil y dinámica, como todos estamos acostumbrados a representarla, sino también austera, pero no menos brillante y épica.

Un ejemplo es el culto al cantante de ópera español de fama mundial Plácido Domingo. Cualquier evento que se desarrolle a su alrededor se convertirá en una sensación no solo de los altos círculos de la sociedad y los conocedores de la música de ópera, sino de toda España.

Hoy en día, podemos ver que las acusaciones de acoso y crueldad hacia las mujeres a menudo caracterizan a personas famosas. También afectó a Domingo. Durante su actuación en el Teatro Romano en 26 septiembre 2021, “Unas 40 personas protestaron contra la actuación del tenor en un recinto público y en un festival que recibe ayudas de la administración. Habían sido convocadas por la Asociación 8M y portaron algunas pancartas donde se podía leer 'No te escuchamos porque las escuchamos a ellas' o 'Plácido abusador'” [4]. El problema mundial de la difamación excesiva y los hechos improbables llevó a tales eventos que afectaron los corazones musicales de los españoles. Sin embargo, a pesar de todo lo absurdo de lo que sucedió, “La recompensa, en cambio, llegó desde las gradas, con las largas ovaciones que recibió por parte de las más de 2.000 personas...” [4].

Esto indica que los españoles no escuchan con los oídos, sino con el alma. Aman su música y sus músicos, y no lo que se esconde detrás del escenario. Un día antes de su actuación en Mérida, Plácido Domingo había querido aclarar en una entrevista a Europa Press que “pedir disculpas no significa haber cometido un abuso” [4], en referencia a unas declaraciones que realizó después de las acusaciones que habían realizado varias mujeres contra él.

Para terminar, me gustaría decir que los corazones españoles guardan muchos otros tesoros culturales que llevan a través de los siglos. Los valores siempre han sido importantes para el pueblo español, y siempre lo han preocupado y emocionarán a sus almas. Porque ver los problemas y resueltos, los eventos y su gran final en las noticias y la literatura es una especie de recordatorio de valores modernos de familia, sociedad y toda España.

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**ОСТРЫЕ СОЦИАЛЬНЫЕ ПРОБЛЕМЫ  
В РОМАНЕ ЧАРЛЬЗА ДИККЕНСА «ТЯЖЕЛЫЕ ВРЕМЕНА»  
ACUTE SOCIAL PROBLEMS RAISED IN “HARD TIMES” BY CHARLES DICKENS**

**Аннотация.** Данная статья рассматривает роман «Тяжелые времена» как самый социально заостренный роман Чарльза Диккенса. Целью статьи является рассмотрение социального конфликта в романе «Тяжелые времена», а также мнений литературных критиков по изучаемой проблеме. Основной конфликт произведения, а именно борьба пролетариата и буржуазии, рассматривается в социальном контексте. Авторы также рассматривают историю создания романа и его важность среди всего корпуса литературных работ Чарльза Диккенса. В статье приводятся высказывания современников Чарльза Диккенса в отношении романа «Тяжелые времена». В заключение авторы приводят примеры работ современников Чарльза Диккенса, которые представляют собой реакцию на чартистское движение в Англии.

**Abstract.** This article examines the novel “Hard Times” as the most socially pointed novel by Charles Dickens. The purpose of the article is to study the social conflict in the novel “Hard Times” and opinions of literary critics about the raised problem. The main conflict of the book, namely the struggle of the proletariat and the bourgeoisie, is studied in the social context. The authors also consider the history of the novel’s creation and its significance among the scope of literary works by Charles Dickens. There are provided statements of contemporaries of Charles Dickens with regard to the novel “Hard Times”. The authors conclude with examples of the works of Charles Dickens’ contemporaries, which constitute the reaction to the Chartist movement in England.

**Ключевые слова:** роман, пролетариат, буржуазия, рабочий класс, рабочее движение, чартистское движение.

**Key words:** novel, proletariat, bourgeoisie, working class, labor movement, chartism.

The novel “Hard Times: For These Times” was first published in Dickens's weekly magazine “Household Words” (April–August of 1854’t), and then released as a book.

“Hard Times” takes a special place among Dickens’s works. Its significance is determined not by its artistic merit, although it is doubtless, but rather by its exceptional acuteness in composing most cardinal socio-political issues of his age.

Besides the novel “Hard Times” is untypical for Dickens – it is the shortest among his novels; it has no characteristic intrigue or complex binding between numerous characters; it has no lyric and humor, and its ending has nothing in common with author’s usual happy ends.

In “Hard Times” for the first time ever Dickens turns to the topic of the working class and the main conflict of the age that is the confrontation between the proletariat and the bourgeoisie. Many Dickens’s contemporaries in his motherland and from abroad have considered this novel as the phenomenon of critical importance. English publicist, historian and art theorist John Ruskin noticed that Dickens raised a subject of high national importance. He considered “Hard times” to be the

greatest work by Dickens. In Russia Nikolay Chernyshevsky highly appreciated the novel: "There is a hard upheaval in the West. In France it has already had several slow and painful crises which have shaken all the people's wellbeing to the ground. Those who want to ensure what is now taking place in England can do with reading "Hard Times" by Dickens (the novel is translated into Russian) if you don't want to read monographs on chartism" [5, p. 121].

Dickens turned to the topic of the working class's struggle at the times when the labor movement became more intense in the beginning of 1850-s after temporary decline. The reality showed that victory of the bourgeoisie had not led to smoothing out class contradictions. These conditions surrounded Dickens at the process of creating "Hard times". This novel appeared as a feedback to the new wave of strikes in industrial areas of the country in 1852–1853.

Dickens responded to chartists' movement and turned to the problem that the people were deeply worrying about. The author revealed reasons which could have led to the people's indignation – hard conditions of life and labor. In his work Dickens is trying to find the way out of this conflict noting the inconsistency of revolution ideas.

Dickens convincingly revealed the validity of workers' strike to struggle for their rights. The inevitability of that strike is caused by desperate needs, excessive labor, moral humiliation. Actions of workers showed the logic of life itself. It appears in specifics of novel composition consisted of three parts: "Sowing", "Reaping", "Garnering" [4, p. 79]. The poetry of titles reflects its movement from the cause to the consequence. The people's anger is the natural consequence for disastrous conditions of labor life. Nevertheless, author does not believe in effectiveness of revolution performances as they scare him.

Charles Dickens identifies his own work as a laconic satire, as he intended "to make some people give thought to the terrible mistake of their time" [2, p. 42]. The "Mistake" is, first of all, a disastrous condition of people. The collision between workers and businessmen was objectively showed here for the first time: the strike on the factory of Bounderby is not just a spontaneous and senseless rebellion but rather the struggle against exploitation.

Dickens provides the book with a dedication full of significance for his contemporaries. "Hard times" is dedicated to Thomas Carlyle – the greatest English publican of the 2-nd quarter of XIX who formulated the acute question of social contradictions in English life. Dicken's contemporary readers could assess the focus of "Hard times" by the dedication itself.

Being a combat public work, the book could not but cause controversial feedback. The ruling class's opinion on Dickens's novel was expressed by Thomas Macaulay, one of the greatest ideologists of "liberal" bourgeoisie. He defined social-political meaning of the novel as "dispirited socialism" [1, p. 697]. By this definition Macaulay let us understand that Dickens's point of view is anti-bourgeois and that he pictures capitalism society in gloomy shades.

The opposite stand was taken by representatives of progressive layers of the English society. Famous publicist and art theorist John Ruskin spoke in support of Dickens. In 1860 Ruskin wrote [6, p. 142]: "...But let us not lose the use of Dickens's wit and insight, because he chooses to speak in a circle of stage fire. He is entirely right in his main drift and purpose in every book he has written; and all of them, but especially Hard Times, should be studied with close and earnest care by persons interested in social questions. They will find much that, is partial, and, because partial, apparently unjust; but if they examine all the evidence on the other side, which Dickens seems to overlook, it will appear, after all their trouble, that his view was the finally right one, grossly and sharply told."

Ruskin's arguments attest to the fact that the truth depicted by the author in his novel appeared to be terrifying for the bourgeoisie. Dickens dared to go against the capitalist society, revealed all its vices and gave hope to people to struggle against injustice [3, p. 100].

The truth about disastrous life conditions of English working class and its growing intention to struggle as well as echo of chartists' movement reflected in a number of novels by Dickens's contemporaries. These topics were illustrated at novels "Mary Barton" and "North and South" by Elizabeth Gaskell, "Shirley" by Charlotte Bronte, "The Life and Adventures of Michael Armstrong: the Factory Boy" by Frances Trollope, "Sybil or The Two Nations" by Benjamin Disraeli. All these works were created at the time of labor movement rise. They starkly illustrate the existence of two



nations within the English society – the proletariat and the bourgeoisie. The intransigence of their interests was impartially revealed in “Hard times”, which added exceptional value to the novel.

In conclusion it should be noted that Charles Dickens tried to resolve the conflict between the proletariat and the bourgeoisie. It is this exact solution that he is looking for in his most socially acute novel “Hard Times: For These Times”.

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## **ЯЗЫКОВЫЕ ОТЛИЧИЯ БРИТАНСКОГО И АМЕРИКАНСКОГО ВАРИАНТОВ РОМАНА «ГАРРИ ПОТТЕР И ФИЛОСОФСКИЙ КАМЕНЬ» LINGUISTIC DIFFERENCE BETWEEN BRITISH AND AMERICAN VARIANTS OF “HARRY POTTER AND THE PHILOSOPHER’S STONE”**

**Аннотация.** Данная статья посвящена анализу различий британского и американского английского языка на примере литературного произведения. В статье речь идет о различиях

между двумя вариантами английского языка в книге Дж. К. Роулинг «Гарри Поттер и философский камень». В ходе исследования текста произведения были проанализированы 5 глав. В работе дана историческая справка о развитии английского языка на двух континентах: в Америке и в Великобритании. В ходе анализа произведения выявлены лексические, орфографические и грамматические отличия. Особое внимание уделено сопоставительному анализу найденных различий. Сделан вывод о том, что среди всех различий преобладают лексические, меньше всего было найдено грамматических различий.

**Abstract.** This article shows the analysis of the differences between the British and American language on the example of the literary work. This article deals with the differences between two variants of the English language in the book “Harry Potter and the Philosopher’s stone” (Am. “Harry Potter and the Sorcerer’s Stone”). Within the given research the text of 5 chapters taken from the book was analyzed. The work gives a historical reference on the development of the English language on two continents: in the USA and in Great Britain. After the analysis of the text fragments, lexical, spelling and grammar differences were found. Special attention is paid to the comparative analysis of the differences. It was concluded that lexical differences prevail among all and grammar differences make the minority.

**Ключевые слова:** литературная норма, британский английский, американский английский, лексические отличия, морфологические отличия, орфографические отличия.

**Key words:** literature norm, British English, American English, lexical difference, spelling difference, grammar difference.

The difference between the variants of the English language in the USA and Great Britain has been attracting researches for a long time. It is known that in works on this topic various elements of American and British versions are considered not in the context of the language system, but with other elements of the language structure. This is the scientific relevance of the topic. It is possible to identify various features of comparable variants of the English language within the standardized literature. There are linguists who consider that American language is one of the dialects of the English language. The dialect is usually opposite to the literary norm adopted in society but American version of the English language has its own literature norm.

The given research deals with the analysis of American and British versions based on the book “Harry potter and The Philosopher’s stone”. It is the first novel in the series of books about the young wizard Harry Potter written by J. K. Rowling. It tells about a boy named Harry who finds out that he is a wizard and he goes to the Hogwarts School of Witchcraft and Wizardry where he meets not only friends but villains too. Together with his friends Harry fights against the Lord Voldemort who killed Harry’s parents. The book was translated into many other languages. Also, due to some differences between American and British English, the book was published in the USA with the title “Harry Potter and the Sorcerer’s stone”. Moreover, this material base very timely as Harry Potter novel has become incredibly popular since it was published. The Harry Potter books rank second in circulation after the Bible. The characters of this story have become icons for million people all over the world. Books about “the boy who lived” read both children and adults.

The aim of this research is to learn differences between the British and American variants within fragments of the book “Harry Potter and the Philosopher’s stone”.

After the French conquest of 1066 there were three languages dominated in England: French among the nobility, English, among of the rest of the population and Latin in science. The mixture of these three languages laid the foundation of the formation of modern English. After the struggle between English and French, English won, but it changed greatly – French vocabulary became its integral part. English was brought to America by English colonists at the beginning of the 17th century. The colonists founded two colonies, the inhabitants of which had different linguistic

traditions. The immigrants from Ireland, Spain, France, as well as the Dutch, Germans and Africans, who arrived in America in the 17th century, made their contribution to the formation of the colony dialects. [1] Also, most of the differences in vocabulary between British and American English refer to the words which stand up for subjects and concepts of the 19th and mid-20th centuries due to the fact that the formation of new vocabulary took place in the USA and Great Britain separately. Besides, there are differences in slang, idioms and phrasal verbs [3].

Here is an example of the lexical difference taken from the analysed novel:

*holiday – vacation*

Holiday (Br) – a period of time spent travelling or resting away from home [4].

(Br) *'On holiday in Majorka,' snapped Aunt Petunia* [5, p. 24].

Vacation (Am) – a period of time spent travelling or resting away from home [4].

(Am) *"On vacation in Majorka," snapped Aunt Petunia* [6].

Here, we see that these two words have absolutely the same meaning but they are used in different variants of English. Such differences exist because the words were borrowed from different languages in Britain and America. Through the analysis of the book the following pairs of words were found: cinema – movie, roundabout – carousel, jumper – sweater, motorcycle – motorbike, bin – trash can, letter-box – mail slot, post – mail, toilet – bathroom, car park – parking garage, motorway – highway etc. In sum, 56 differences were discovered.

Due to the simplified spelling in American English, it adopts more to the sound of a word, while the British version usually retains the features of the original languages (French, Spanish) where the words were derived. Sometimes word formation in American English more often occurs with the help of compounding [2].

*practise – practice*

Practise (Br) / practice (Am) – doing an activity or training regularly so that you can improve your skill; the time you spend doing this [4].

(Br) *Want to come upstairs and practise?* [5, p. 34].

(Am) *Want to come upstairs and practice?* [6].

In this case, in British English the word 'practise' is written with the letter 's' because this word came from French and became to be written in this way, though people in America write this word the way they hear it. Within the analysis of the text fragments the pairs of words such as grey – gray, harbour – harbor, mum – mom, punch-bag – punching bag, letter-bombs – letter bombs, top-security – top security, window-sill – windowsill, tea-bags – teabags, any more – anymore etc. were found. Eventually, 29 spelling differences were discovered.

There were also grammar differences.

*maths – math*

Maths/math (Oxford dictionary) – mathematics, especially as a subject in school [4].

(Br) *I can't, you know, do maths and stuff* [5, p. 54].

(Am) *I can't, you know, do math and stuff* [6].

Also, during analysis of the text fragments, such pairs of words were found: *towards – toward, smeltings stick – smelting stick*. In total, there are 24 grammar differences.

The total number of the differences is shown on the graph (Figure 1).

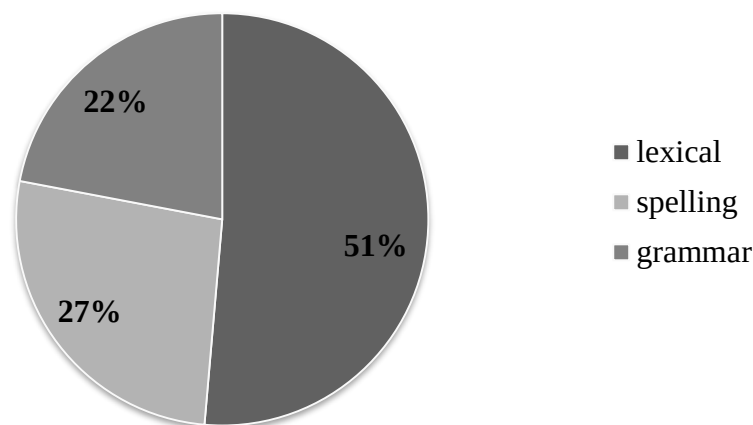


**Figure 1.** The proportion of lexical, spelling and grammar differences found

As it is shown on the Figure 1, during analysis of the text fragments, 3 types of differences were found. The total number is 109. These are lexical, spelling and grammar differences. Lexical differences make 51%, while spelling and grammar are about the same amount 27% and 22% correspondingly. As a result of the research we can see that among the total number, lexical differences prevail. This indicates that the most changes occurred in the vocabulary of the language. All these differences can be explained by the separate development of American and British variants of English.

Overall, there are more lexical differences because American English took new words from the languages of the native people while a lot of words came to British English from European languages and also from numerous British colonies. On the contrary, grammar differences are the least as grammar hasn't undergone such crucial changes.

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## **ХРОНОТОП В ПОЭМЕ ДАНИИЛА АНДРЕЕВА «ЖЕЛЕЗНАЯ МИСТЕРИЯ» CHRONOTOPE IN THE POEM BY DANIIL ANDREEV "THE IRON MYSTERY"**

**Аннотация.** Произведения Даниила Андреева только входят в научный оборот, поэтому исследований его работ не так много. В данной работе предпринимается попытка комплексного анализа пространственно-временной организации поэмы «Железная мистерия». Тезисы посвящены описанию художественного пространства и времени в поэме, выявлению изменений в хронотопе. В результате анализа было выявлено, что метакультура является хронотопом с национальной спецификой. Он охватывает все слои планеты (пространства) и объединяется временем. В работе описывается структура хронотопа российской метакультуры, который сравнивается с вертикальным хронотопом по М. Бахтину. Вводится понятие метакхронотопа, отмечается его переход в хронотоп Розы Мира и связанные с ним изменения в пространстве и времени.

**Abstract.** The works of Daniil Andreev are currently only entering the scientific circulation, so there are not so many studies devoted to his works. In this paper, an attempt is made to comprehensively analyze the spatial-temporal organization of the poem "The Iron Mystery". The research is devoted to the description of artistic space and time in the poem, the identification of changes in the chronotope. As a result of the analysis, it was revealed that metaculture is a chronotope with national specifics. It covers all layers of the planet (space) and is united by time. The paper describes the structure of the chronotope of the Russian metaculture, which is compared with the vertical chronotope according to M. Bakhtin. The concept of a metachronotope is

introduced, its transition to the Rose of the World chronotope is noted and related changes in space and time are highlighted.

**Ключевые слова:** хронотоп, пространство, время, метахронотоп, Даниил Андреев.

**Key words:** chronotope, space, time, metachronotope, Daniil Andreev.

Daniil Andreev's legacy was published at the turn of the 1990s. Since then, specialists in various fields have been interested in his works. Andreev's works, syncretic in genre and stylistic plans, give rise to many debatable questions about the methods of studying his works. Our work is aimed at analysing the poem "The Iron Mystery" as a literary work and describing its chronotope structure.

The cosmology of Daniil Andreev is based on the concept that the Universe has multiple layers. The planetary multilayer space is called Shadanakar and has 242 layers including the terrestrial three-dimensional world – Enrof. The layers are connected with each other by common metahistorical processes, by the presence of a "*pair of warring spiritual poles*" [1], as well as by metaculture. All layers of metaculture are united by time. Time, interacting with space, creates events experienced by a separate metaculture, which makes it possible to represent it as a chronotope with national specificity. At the center of the poem there is the chronotope of the Russian metaculture.

Daniil Andreev organizes the space of the poem horizontally. The author gives a detailed description of the Middle (physical) layer of the Russian metaculture: "*Its center is the Citadel; to the right of it there is a five-domed cathedral, to the left there is a palace of the Augustus. Around this architectural ensemble there are districts of rich houses with columns, vast areas of multi-story buildings and shacks, factory suburbs*" [2, p. 3]. The concept of the sides of the world in the images of demiurges is introduced. The author gives them names depending on the part of the world in which their metaculture is located. Witzraors' names also reflect the metaculture to which they belong. Both a demiurge and a witsraor with national characteristics are attached to each metaculture, which makes the space nationally specific. Other metacultures are separated from the area of conventional Russia by mountains and the sea. The world behind the mountains is hostile: the conquest of new lands by Russia is marked by the shift of the mountain range, the penetration of the Witzraors of other metacultures into the lower layer of the Russian metaculture is marked as an invasion.

The space of the poem is also organised vertically. In "The Iron Mystery", the upper and lower layers are contrasted. At the very bottom there is the core of the planet. In the middle there is the world of people. The upper layer is Heavenly Russia. The opposition "divine – demonic" corresponds to them. The actions of mythological creatures are reflected in the earthly world and influence historical figures.

In the treatise "The Rose of the World" Daniil Andreev writes about the coincidence of the boundaries of all layers of metaculture. When reading and analyzing "The Iron Mystery", the space is presented as a funnel since the text contains allusions to Dante's Divine Comedy. M. Bakhtin singles out a vertical chronotope when analyzing Dante's "Divine Comedy". Its features are the space, elongated vertically, and the simultaneity of the world. "*Everything that is divided by time on the earth converges in the eternity into the pure simultaneity of coexistence*" [3, p. 308]. According to M. Bakhtin, Dante's political and historical concepts are drawn into the vertical hierarchy. Some images tend to go to the historical horizontal, which is realized in stories about the life of historical figures, but they remain just an offshoot of the vertical. A similar arrangement of the chronotope is characteristic of Daniil Andreev's "The Iron Mystery". We see the differences when analyzing artistic time.

The time in the poem "The Iron Mystery" is the same for all existing toposes since it is connected with them by the same events. Events cover different layers of Enrof and are united into

a single multi-level process, which is characteristic of a vertical chronotope. Time unites toposes into one large metacultural chronotope.

Despite the similarity with the vertical chronotope of the “Divine Comedy”, the chronotope in the poem “The Iron Mystery” is distinguished by the predominance of historical artistic time. Time in the “The Iron Mystery” is long: it includes historical events, starting with the February Revolution and ending with the reign of N. Khrushchev. The acts of the poem coincide with historical events. Time is unidirectional and irreversible; it moves from the past to the future from the point of view of the author. Each event goes sequentially one after another. Events of several decades fit into a short period of one day.

Changes in space and time are associated with the formation of a new model of the world in the poem. The victory over Zhrugr of the combined forces of the Witsraors and demiurges of different metacultures leads to the transition of the metachronotope of Shadanakar into a single chronotope – the Rose of the World. In the article, the term metachronotope is considered as a result of the interaction of the sum of chronotopes, as a common chronotope. In Daniil Andreev's cosmology, the metachronotope is understood as the interaction of various metacultures. Metacultures create a system of chronotopes interconnected by the commonality of metahistorical processes, which is a metachronotope. The transition of the metachronotope is characterized by a change in materiality, destruction of boundaries between layers and expansion of space to cosmic scales.

Thus, the work introduces the concepts of chronotope of metacultures and metachronotope as their systems. The chronotope of the metaculture is similar to the vertical chronotope identified by M. Bakhtin. The main difference is the predominance of historical artistic time in the poem and the horizontal division of space. The national specificity of chronotopes of metacultures is noted which is lost during the transition of the metachronotope to the Rose of the World. The transition embodies the idea of uniting metacultures into a brotherhood with interreligion and interculturalism.

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**КОММЕМОРАТИВНЫЕ ПРАКТИКИ ГОРОДА  
В ЛИНГВОДИСКУРСИВНОЙ ПЕРСПЕКТИВЕ  
COMMEMORATIVE PRACTICES IN URBAN SPACE:  
A LINGUODISCURSIVE PERSPECTIVE**

**Аннотация.** Статья посвящена изучению такого феномена как коммеморативная дискурсивная практика с позиции науки о языке. В фокусе исследования находятся мнемические нарративы, объективированные в виде текстов мемориальных досок, как особая форма коммеморативной дискурсивной практики большого города. В работе освещаются дискуссионные вопросы, связанные с изучением поликодовой коммуникативной среды мегаполиса. В целях работы с данным исследовательским полем предлагается применить интегративный подход, преимущество которого заключается в возможности сопряжения положений теории дискурса и нарратологии.

**Abstract.** The paper deals with commemorative practices approached from the position of linguistics. The research focuses on mnemonic narratives objectified as memorial plaques – a form of commemoration spread in the urban space. The paper discusses controversial issues of the urban multimodal communicative environment and promotes an integrative approach to this field of study stressing its advantages that manifest in combining discourse analysis and narratology.

**Ключевые слова:** коммеморация, коммеморативные дискурсивные практики, мнемический нарратив, мемориальная доска, коммуникативное пространство города.

**Key words:** commemoration, commemorative discourse practices, mnemonic narrative, memorial plaque, urban communicative space.

Memory researchers state a rising interest in the commemoration phenomenon, namely, in its linguistic explication, which is due to the “linguistic turn” in social sciences and humanities – an awareness of the fact that collective memory does not exist outside its linguistic manifestation. Memory is turning into the most important debatable problem in various fields of studies, such as linguistics, sociology, cultural studies, history, political science, and a new research paradigm is being actively formed.



In today's world, one can state a growing need on the part of the society to preserve collective memory in order to protect its own identity under the influence of technologization and globalization of discursive interaction (A. Assmann, M. Halbwachs, P. Nora, B. Schwartz, G. Fine, E. Hobsbaum, N. Fairclough, M. Foucault); an increasing interest in the relationship between language and memory, language categorization and conceptualization of mnemonic narratives by means of natural language (N.G. Bragina, B.M. Gasparov, M.A. Dmitrovskaya, E.S. Kubryakova, L.M. Nyubina, L.N. Rebrina, O.G. Revzina, P. Ricoeur, I.V. Tivyaeva).

Currently, there is a research lacuna as far as commemorative texts functioning in the urban environment – which is viewed as a special communicative multimodal space (see, for instance [4; 5; 9]) – are concerned. The communicative-semiotic aspect of a megalopolis as an existential phenomenon is considered by linguists from the position of the text study as a continuum of communities and urban subcultures. The main claim is that urban life and urban relations analysis should rely on the concepts of thesaurus, semantic situation, communication, text as a product of communicative-semiotic activity [6, p. 221].

Social actors include various representations of the past in the present. Community memory is preserved in the urban multimodal environment in the form of toponymy, architectural and sculptural memorial structures, memorial signs, temples, necropolises, museums, memorial complexes and memorial plaques. It is constantly being reorganized in accordance with the demands on the part of the society. Mnemonic narrative defined and described in [6; 7] becomes an object of numerous retellings by members of the community, passing from generation to generation. The communicative resource of the linguistic community, historically built in various socio-cultural spheres, is represented by discursive practices that provide stable cognitive and communicative behavioral patterns of a certain linguistic and cultural community.

Commemoration in the urban environment is a special kind of discursive practice, a specific way of understanding and interpreting public life. As defined by O.S. Issers [2, p. 10], discursive practices are “socially established, conventional and articulate actions in speech to solve recurrent communicative problems and intentions in the appropriate linguistic and cultural space in the spheres of institutional and non-institutional communication”.

Memorial plaques, a specific variety of mnemonic narratives, functioning as a commemorative discursive practice of a megalopolis seem to be a productive field of study. Fixing commemorative priorities and political agendas of various social actors, setting symbolic markings for urban space, memorial plaques both perform important socio-cultural functions and function as an integral element of everyday interaction practices between the city and its residents. They make the communicative multimodal space of the metropolis more intelligible and accessible for use in everyday communication. The practice of using plaques connects the past and the present as well as helps maintain the social and political status quo, or (although much less often) provides a better representation to the interests of various minority groups, which are often ignored in the relationship between the past and the present.

The text of the memorial plaque acts as one of the constitutive elements of the commemorative discourse of the city. A memory plaque becomes an effective tool for knowledge transfer when not only practical and theoretical information, but also skills and attitudes are transferred from the author of the text to the reader [1, p. 39].

An integrative approach should be adopted when dealing with the study of such specific commemorative practices as texts of memorial plaques. It seems productive in analyzing ways of commemoration object indication and strategies of performing the consolidating function in commemoration texts. In fact, the perspective field of study can be focused around the choice of evaluative units for reactualization of commemoration objects; implementation of different types of emotional featuring; functioning of basic (nuclear) toponyms; implementation of imperative modality, necessity and obligation modality; the impact on the emotional sphere of the addressee [3, pp.76-78].

It can be concluded that commemorative discursive practices in the urban space represented by texts of memorial plaques are based on recurrent narrative schemes that correlate with their

cognitive-content specifics. The novelty of the presented approach lies, firstly, in the fact that the commemorative discursive practices of the metropolis become the object of a comprehensive study and analysis based on new language data – mnemonic texts of memorial plaques. Secondly, an attempt has been made to investigate mnemonic narratives in the multimodal communicative space of a megalopolis from the point of view of discourse theory and narratology.

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## **ИМЕНА СОБСТВЕННЫЕ В ГАСТРОНОМИИ PROPER NAMES IN GASTRONOMY**

**Аннотация.** Статья посвящена анализу использования имен собственных в гастрономических названиях. Цель данного исследования – выявить, какие группы имен собственных задействованы при названии блюд. Исходя из подробного анализа имен собственных, можно выделить два их типа. Первый – имена собственные, которые происходят от имени или фамилии известного человека. Второй – имена собственные, связанные с географическим названием. Также, в статье рассмотрены исторические предпосылки появления имен собственных в гастрономии. Основное внимание уделяется кулинаронимам, названных в честь людей, дана их классификация и предложены примеры. Сделан вывод о том, что названия кулинаронимов позволяют раскрыть образы национального сознания людей, создающих то или иное кулинарное блюдо. Эта статья может быть интересна как специалистам в области изучения лингвистики и иностранных языков, так и специалистам в области гастрономии.

**Abstract.** The article tackles the problem of using proper names in gastronomic titles. The purpose of this study is to find out what groups of names are taken when calling the dishes. On the basis of detailed analysis of proper names, we can distinguish two types. The first type is the first names, which are derived from the name or surname of a famous person. The second includes the proper names associated with geographical names. At the same time, the article deals with the historical origin of proper names in gastronomy. Much attention is given to the culinaronyms named after people; their classification is given as well as examples suggested. It is concluded that the names of culinarinymys allow to reveal the images of national consciousness of the people, who create this or that dish. This article can be interesting both to specialists in the field of linguistics and foreign language studies, and to specialists in gastronomy.

**Ключевые слова:** ономастика, кулинаронимы, имена собственные, гастрономия, происхождение названий блюд.

**Key words:** onomastics, culinaronyms, proper names, gastronomy, the origin of the dish names.

It is generally known that English nouns are divided into common and proper. A common noun gives a general description of all spheres of human's life. A proper noun describes particular person or place, gives name to the geographical object and means full name of an exact object. Proper nouns are considered the main object of onomastics, a science, which studies mechanisms, development, meanings, and etymology of proper nouns [2, p. 15]. In modern world, due to the development of international relations, the interest of scientists in the study of linguistic and lingo-cultural concepts of the culture of various countries has increased. The study of names, particularly

culinary names is very timely nowadays because it can help to identify the origin and historical development of some certain gastronomic term. Thus, the purpose of this study is grouping proper names used in calling the dishes.

Gastronomic names combine different names of dishes and food. Each nation has its own products and meals that they appreciate. Sometimes food gets names from nationalities. The name of the same dish is sometimes different in different cultures. With the development of civilization, food has become a cultural concept. Eating became a main and integral tradition of some nation's lives. Food is a cultural category of lifestyle. The names of dishes, namely gastronomic names, create associations with a nation and people of a certain culture.

Through the study of gastronomic discourse, it is possible to observe the formation of images in the worldview of a nation. Before the 16th century, the names of dishes and drinks appeared in almost all European countries: they were either inexplicable (ancient) names (soup, bread, porridge), or culinary names that speak about their contents or the form and method of preparation (sponge, cake). Since the 17th century, special new names have been introduced to the gastronomy of Europe, which are not related to the use of words in the names indicating the main ingredient (fish, potato, pork), its part (legs, heart, tongue) or a shade of taste (peach, plum) [3, p. 68].

Sometimes, in order to glorify a small restaurant or tavern, local chefs named dishes and drinks after the area where the restaurant was located. That was the way of making outlying areas and counties more famous. Correspondingly, this is how the famous Yorkshire pudding, the California roll and other names of dishes and drinks, that we all know and appreciate, appeared.

According to morphology there are two main types of gastro-names:

- personal names,
- geographical names.

According to structure culinary names presented by personal names can be divided into [1]:

- culinary names represented only by the first name or only by the last name,
- culinary names represented by first and last name,
- culinary names represented by a name and some ingredient.

The first group of personal names can be illustrated by a few examples. Historically, most of the dishes and drinks were named after their creator or famous person. However, the creators often used either the name or surname in order to shorten the dish name. As a result certain misunderstanding could take place. For example, Caesar Salad is personified with the name of the great Roman commander Julius Caesar. But the salad was invented by two brothers – Caesar and Alex Cardini, who owned an Italian restaurant in America (nowadays the city belongs to Mexico). Initially, the salad included anchovies and was called “Aviator salad” because Alex was a pilot. Later, one of the brothers decided to slightly change the recipe and named the dish after himself – Caesar [4].

Another example is – sandwich – the most famous meal in the world. This traditional dish with a filling between two slices of bread got its name in honor of John Montague, who was the fourth Earl of Sandwich (1718–1792). There are several legends about how exactly the sandwich acquired its famous name. According to one version, John Montague was a poker player who loved to spend evenings in the company of friends, while playing casino games. Sometimes the poker games were so long that Montague could not break away from the game for a snack. Therefore, in 1762, during another protracted poker game, John showed ingenuity and asked the cook to put a steak between two slices of bread. Therefore, he killed two birds with one stone: and had a snack without getting his hands or cards dirty, and continued the game [4].

The second group is much smaller and consists of only a few dishes and drink names. For example, Ronald Reagan Soup. In 1986, the 40th president of the United States, Ronald Reagan, declared his love for delicious French soup. Thanks to this, the typical American soup gained its popularity. In addition, the Earl Grey Tea is also included into this subgroup. In 1830 the British Prime Minister Earl Charles Grey (Earl Charles Grey, 1764–1845) named the well-known hot drink after himself. Historically, minister got a bergamot tea as a gift from Chinese sailor, who almost lost

his son after a shipwreck. But Earl Charles Grey saved him luckily. That is why he named the tea after himself [4].

The third group is also not big. There are very few names of dishes of this type, represented only by the name or only the surname, with the addition of various ingredients. For example, that is how Peach Melba cake was named. Auguste Escoffier created a dessert of boiled peach, vanilla ice cream and raspberry sauce in honor of the Australian opera singer Dame Nellie Melba. Another example is Banana Foster dessert. Richard Foster was a regular visitor of the famous Brennan's restaurant in New Orleans. The dessert was invented in 1951 by Chef Paul for Foster who was a good friend of the restaurant owner [4].

To conclude the name of this or that dish or drink reflects the specifics of national character, it helps to reveal the cognitive mechanisms of creating images by the certain group of people. It is the powerful instrument of "cultural memory" transfer from one generation to another one. After analyzing some names of dishes three main groups of using proper names were identified: culinaryonyms represented only by the first name or only by the last name, culinaryonyms represented by first and last name, culinaryonyms represented by a name and some ingredient

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## **ТЕОРИИ ПРОИСХОЖДЕНИЯ ЯЗЫКОВОГО МНОГООБРАЗИЯ THEORIES ABOUT THE ORIGIN OF THE LANGUAGE DIVERSITY**

**Аннотация.** Статья посвящена анализу различных подходов к вопросу зарождения языкового многообразия, выявлению между ними общих и различных черт. Особое внимание уделяется междисциплинарному рассмотрению вопроса с привлечением древней литературы и научных трудов историков-лингвистов. Основными источниками для работы стали мифологические и научные методы познания. Первый основан на изучении легенд и преданий, сформировавшихся среди различных народов и племён, приведении религиозных объяснений. Второй – на разборе основных гипотез учёных об историческом прошлом языков, их происхождении. С помощью разнородных источников было выявлено два основных подхода к изучению рассматриваемой темы: теория моногенеза и теория полигенеза. Большая доля существующих на сегодняшний день гипотез относится к первой группе.

**Abstract.** The article is devoted to the problem of different approaches to the issue of the origin of language diversity, to their common and different features. Much attention is given to the interdisciplinary consideration of the issue, involving ancient literature and the scientific works of historians and linguists. The main sources of the work are mythological and scientific methods. The first is based on the study of legends formed among the various tribes and religious explanations as well. The second is based on the analysis of the main hypotheses of scientists about the historical past of languages and their origins. With the help of different sources, two main approaches to the study of the topic raised: monogenetic and polygenetic, where large percentage of the theories and assumptions existing today belong to the first group.

**Ключевые слова:** языковое разнообразие, лингвистика, история языков, происхождение языка, мифы о языке, языковые теории.

**Key words:** language diversity, linguistics, language history, the origin of language, language myths, language history.

Nowadays, language is presented as something ordinary. There are nearby 7000 languages spoken across the Globe. That number is constantly in flux, as people are learning more about the world's languages every day. Beyond that, the languages themselves are always in a state of changing. They are living and dynamic, spoken by communities whose lives are shaped by intensively developing world. However, scientists still have not come to the one clear explanation of this variety. Indeed, the invention of language may be the most important event in human evolution, as many developments followed it. For instance, Edward Sapir, who is American anthropologist-linguist, speculated that some embryonic form of language must have been available to early man to help him fashion tools from stone [3]. Nevertheless, it is still unknown how humanity came to this idea.

In different times people had various explanations to this problem. These theories involve not only scientific concepts, but mythological as well. However, none of them can be accepted as true due to lack of evidences. There's not enough information about the origins of language, and there are only theories about how early ancestors formed their first words and sentences in different ways. In this article we are going to investigate the main theories and find some common idea among them.

Since the dawn of humanity, outstanding minds in an effort to know themselves and the world around them could not help but be carried away by solving the mystery of the origin of language. And yet, despite the lack of information, they did not stop making assumptions that have come down to modern days as legends and myths. The mythological approach to the question also varies from continents, as languages do. Despite the fact that they are full of fantastic twists, some of them are united in some ways (the Deluge or disputes between people).

The first myth is most famous, and it is connected to the Bible. The history of it is given in Genesis 11:1–9 and appears to be an attempt to explain the existence of diverse human languages. Tower of Babel is a structure built in the land of Shinar (Babylonia) sometime after the Deluge. According to Genesis, the inhabitants, Babylonians, wanted to make a name for themselves by building a mighty city and a tower “with its top in the heavens”. This Tower of Babel would be a symbol that would keep them united as a powerful people. Nevertheless, God was not pleased with the people's idea of omnipotence: “If as one people speaking the same language, they have begun to do this, then nothing they plan to do will be impossible for them. Come, let us go down and confuse their language, so they will not understand each other” [2]. He disrupted the work by confusing the language of the workers that they could no longer understand one another. The city was never completed, and the people were dispersed over the face of the earth.

North American myth, which was popular among Indian tribes, is similar to the first one, as it also described the Deluge – the reason of people's misfortune [4]. Before this disaster humanity lived in one country with one common language.

The other one, African story, tells that for many years people spoke one language to each other. However, as famine came, the harmony and balance between humans collapsed. The insanity was spread among all people, and they started to run away for better places to live, while murmuring odd words under their breath – this is how different languages developed.

These are the most outstanding legends around the world that have been preserved to modern days. They are united with the idea that there was a time when people did speak one global language, and this fact supports the idea that all present languages have occurred from one site.

The scientific look on language diversity differs as well. There are two main beliefs: the first one is that all languages ever spoken by humans are originated from one single language, proto-language, which was spread across the world due to early humans' nomadic nature. The proto-language is the most recent common ancestor of a language family, immediately before the family started to diverge into the attested daughter languages [1]. This idea is called as monogenesis. It is based on the biological concept of the origin of mankind from one tribe. African's continent is considered to be a humanities' place of birth. This belief strongly related to the Bible myth, as it also states that people had common language. However, the idea of proto-language is not known directly. This was found by applying the comparative method to a group of languages featuring similar characteristics. Moreover, this hypothesis is only an assumption which is based on the thought that there may have been a proto-language, but it was primitive, as it had just emerged from the communication system of higher primates. Scientists do not deny the possibility of a single root, but they believe that this idea cannot be absolute.

The second hypothesis is known as polygenesis, and it says that, the same way humans evolved parallel in different parts of the world, so did the language. Each of the original languages then was split into numerous different ones. It is based on the idea that people in other areas of the world with different needs and backgrounds, would likely develop other words. In this way, different languages might have developed independently all around the world. That is why nowadays we have various families of languages, which differ from each other (for example Indo-European and Sino-Tibetan).

To conclude, since the early age humanity were guessing the truth about language diversity by creating myths, legends and making hypothesis. So far, linguists came to the two main assumptions that oppose each other: monogenesis theory, which is supported by the mythological approach vs the polygenesis theory. Nevertheless, it is still impossible to define what idea is right due to lack of strong evidence, which have not been preserved to our days.

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### ТРАДИЦИОННЫЕ СМИ VS. БЛОГЕРЫ TRADITIONAL MEDIA VS. BLOGGERS

**Аннотация.** В данной работе через призму динамичного развития компьютерных технологий и сети Интернет рассматриваются традиционные средства массовой информации



в сравнении с более новым способом трансляции тех или иных данных, чей правовой статус является неопределенным и дискуссионным – блогерами. Анализируется каждый из двух видов коммуникации, что позволяет выявить как положительные, так и отрицательные стороны классических СМИ и сферы блогеров, а также выделить их особенности и отметить общие черты. Делается вывод о том, что, несмотря на возрастание влияния блогосферы, она не сможет полностью заменить собой традиционные средства массовой информации. Представляется, что оба этих вида информационной коммуникации могут достаточно успешно существовать и развиваться параллельно, в чем-то дополняя друг друга.

**Abstract.** This article considers through the prism of the dynamic development of computer technologies and the Internet the traditional mass media in comparison with a newer way of broadcasting certain data, whose legal status is uncertain and debatable – bloggers. Each of the two types of communication is analyzed, which allows to identify both positive and negative sides of the classical media and the bloggers' sphere, as well as to highlight their peculiarities and note common features. It is concluded that despite the increasing influence of the blogosphere, it will not be able to replace completely the traditional mass media. It seems that both of these types of information communication can successfully exist and develop in parallel, complementing each other in some way.

**Ключевые слова:** СМИ, блогеры, блогосфера, технический прогресс, Интернет, информация.

**Key words:** mass media, bloggers, blogosphere, technical progress, Internet, information.

The current century in the history of mankind has already received quite a sustainable name of the information era. One of its most significant characterizing criteria is the mass media. The steady revolution of computer technologies has led to the fact that the media have penetrated into all spheres of human life: politics, economics, culture, sports, etc., and information has become more open and is now spreading faster among a wide audience.

Nevertheless, there are also completely new types of public data transmission that have surely occupied their niche in the media space and are an integral part of it – bloggers. But if the term “mass media” is clear and means a separate institution of society that conducts various manipulations with information on a huge scale with the help of technical devices, then the interpretation of the concept of “bloggers” as well as its very meaning are rather vague and are the subjects of discussion among members of the public. In this regard, the problem of the confrontation between the classical media and the bloggers' sphere is a relevant issue that requires a detailed analysis of each of these types of information transmission, which will allow to find out the future of such means of communication.

It should be noted that attempts to legally equate bloggers with journalists appeared in the Russian Federation quite a long time ago. So, in 2014, a law came into force that obliged the author of a blog with a daily audience of more than three thousand people to register with the Federal Service for Supervision of Communications, Information Technologies and Mass Communications. In addition, the blogger was a subject to the same duties as a journalist: the need to check the published data for reliability, as well as for compliance with other laws. In 2017, this rule was canceled due to inefficiency, as well as due to negative responses from the public. Critics of the bill express fears that the document is an attempt to restrict the free distribution of information on the Internet and will primarily hit political bloggers [1].

However, the dynamic growth of the number of blogs and their influence makes lawmakers return to the issue of bloggers. This is also due to the objective necessities of regulating the activities of blog authors and granting them certain rights, for example, security, gaining access to materials, attending mass events, etc.

In addition, an important problem is the establishment of the legal status of a blogger. In order

to do this correctly, it is necessary to determine who the blogger is. If we proceed from the definition that a blogger is a person who lives a blog, then it is not completely clear whether the state should provide him with any social guarantees that journalists have. Thus, the correspondent is an employee of a publication officially registered by the state, which serves as a verification of his status and authority. A blogger can even be a minor person who has a video camera and Internet access. Moreover, the content of its electronic resource may be limited, for example, to personal stories from life. The official media and journalists report socially significant information.

As a result, it seems that the state should develop a certain model that would selectively, but at the same time voluntarily allow owners to verify their blogs in a state body, and therefore receive the same rights and obligations as journalists.

In order to find out whether the blogosphere is able to displace traditional mass media, it is necessary to analyze these two types of data transmission and compare them with each other. As for the official media, which, first of all, includes television with the absolute majority of federal state channels, they are more professional in comparison with bloggers. This data is due to the fact that classical mass media, as a rule, have competent personnel, that is, not just certified journalists, who are already relatively rare in the blogosphere, but also specialists in certain branches of human activity, for example, sports or politics.

In addition, traditional media have better equipment: special TV cameras and other facilities, unlike a blogger who often uses only his smartphone's camera. A significant aspect also lies in the fact that the classical mass media are regular and responsible, that is, they come out according to a certain schedule. Bloggers can also release this or that information irregularly, based on their preference, which prevents blog visitors from getting acquainted with various events in a timely manner. Thus, the official representative of the Russian Foreign Ministry, M. Zakharova stated that "talents can be the same, but education and responsibility are different things" [2]. Thus, it seems impossible to absolutely equate professional journalists with bloggers.

However, the objective fact is that the supporters of traditional media are mainly older generation. Young people mostly visit certain blogs. This is according to several reasons. First, with technical progress in general. Thus, the development and distribution of television in the second half of the XX century began to displace paper media, for example, newspapers, to some extent. Today, the evolution of Internet technologies is actively replacing above-mentioned TV channels.

Secondly, the media themselves, or rather their editorial policy, are largely involved in the loss of the share of the young audience. Thus, the content of TV channels no longer meets the needs of young people. And this applies not only to obsessive political talk shows and programs where family faction or obscene scenes are excessively demonstrated, but also a number of other programs.

It is also necessary to highlight separately the element of interactivity that distinguishes the blogosphere. In the context of the social comparison theory, people can now compare themselves to someone they think they might be similar to, based off looking at their profile when really a person has no idea about [4]. In other words, a blogger who has a smartphone and the same capabilities as ordinary users of social networks is in closer contact with the latter than, for example, television with the viewer.

In addition, traditional mass media are often censored in terms of content, they keep silence concerning any problem, they worry excessively about their ratings, they can be biased by the authorities or their owners. As an example, we can cite the meetings within Khabarovsk Territory began in July of the last year and received relatively modest coverage, unlike the blogosphere, by federal channels and news agencies. Thus, being free by anyone and nothing "from above", a blogger cannot ignore any issue, he attracts public attention to it and often serves as the primary source or even an eyewitness of events.

For example, mobile reporters have become excessively popular, when a person takes an incident on a smartphone, sends a video somewhere and receives a deposit for this. However, it is worth noting towards such a practice, on one hand, it can be harmful from the point of view that instead of providing the necessary assistance to those who have been in an accident, eyewitnesses record a video. On the other hand, taking into account the experience of people's lives in the

conditions of war in Donbass, it is necessary to note the so-called roll calls. Groups were created in social networks where users promptly published information about shooting or explosions within their areas of residence, up to specifying the caliber of shells, as well as the direction from they came. Such activities helped to orient people, as well as to some extent saved their lives.

Among other things, an important aspect is the format and language of broadcasting. It seems that the traditional media are also outdated and do not correspond to the interest of young people. Bloggers, in this sense, are closer to their viewers, they are on the same wavelength, etc. An important characteristic feature of the blog is its openness and accessibility. Any user, whoever can become a witness of the content published in the blog. Because of this, blogs are considered a form of “live communication” in the global network [3].

However, it is worth mentioning that the development of the blogosphere increases the risk that popular bloggers with a large number of subscribers will cease to be objective for financial or other dividends, will substitute facts and use any high-profile events for the sake of their own popularity, rather than solving a particular problem.

Comparing traditional media with bloggers, it is necessary to highlight the problem of advertising. So, on modern television, its display is not inferior to the general timing of the program itself, which causes some discomfort to the observer. In addition, due to some sponsorship contracts, a particular TV channel may conduct self-censorship, that is, deliberately avoid criticism of it, etc. Nevertheless, the scale of advertising is increasingly growing in the developing Internet. This is due both to the desire of advertisers themselves to benefit, and to the aspirations of bloggers to monetize their channel, that is, to earn money. These facts naturally cause irritation among Internet users.

Thus, after analyzing such types of information transmission as traditional media and the blogosphere, it seems they are not so much competitors as they complement each other and are united by a common name – media. If the classical mass media report the official position of the state concerning any issue, then bloggers convey their opinion, focus on different sides of the problem. Summing up, the thesis that bloggers will be able to completely displace traditional media seems premature, but the competition within these two spheres remains of great importance, so that a user can get a variety of opinions for one request.

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**ОТНОШЕНИЕ К ЖИЗНИ И СМЕРТИ В РОМАНЕ ХАРУКИ  
МУРАКАМИ «НОРВЕЖСКИЙ ЛЕС»: ОПРЕДЕЛЕНИЕ ПОНЯТИЯ  
СОВЕРШЕННОГО НЕСОВЕРШЕНСТВА В ЯПОНСКОЙ ФИЛОСОФИИ  
THE ATTITUDE TO DEATH AND LIFE IN HARUKI MURAKAMI'S NOVEL  
“NORWEGIAN WOOD”: THE DEFINITION OF THE CONCEPT OF PERFECT  
IMPERFECTION IN JAPANESE PHILOSOPHY**

**Аннотация.** Актуальность исследования обусловлена потребностями общества к познанию в связи с неизбежностью быстрого изменения реалий. Для востребованности в обществе человеку необходимо быть всесторонне развитым. Знание философских направлений разных народов необходимо для составления общей картины мира прошлого, сегодняшнего и будущего. Объектом изучения является философия японских мыслителей современности и их взглядов на обыденность течения жизни и ее завершении. Предметом изучения является произведение Харуки Мураками «Норвежский лес», феномен совершенства в несовершенстве.

**Abstract.** The relevance of the research is due to the needs of society for knowledge in connection with the inevitability of a change in realities. To be in demand in society, a person needs to be comprehensively developed. Knowledge of the philosophical trends of different peoples is necessary to compile a general picture of the world of the past, present and future. The object of study is the philosophy of Japanese thinkers of modernity and their view of the ordinary course of life. The subject of the study is the work of the modern Japanese writer Haruki Murakami “Norwegian Wood”, a phenomenon of perfect imperfection.

**Ключевые слова:** гармония, японская культура, синтоизм, буддизм, конфуцианство, «моно-но-аваре», искусство несовершенства.

**Key words:** harmony, Japanese culture, Shintoism, Buddhism, Confucianism, “mono-noaware”, art of imperfection.

The study of philosophy and the individual authors' flow of thought is an integral part of the knowledge of the world. Philosophy as a science forms the theoretical basis of generalized knowledge, it helps a person to get out of the narrow framework of his habitual thinking, to cultivate in him an incentive to increase his level of the culture of thinking, and also to give an opportunity to begin the development of personality and its spiritual component. Traditional Japanese prose is a layer of special philosophical concepts accumulated since ancient times, namely since the appearance of hieroglyphic writing. Japanese literature is characterized by a romantic hero with a keen sense of justice and responsibility, who should be a model for building correct views in society. Shintoism, Buddhism and Confucianism continue to have a huge influence on Japanese literature, religious and philosophical trends that form the life and way of thinking of a resident of the Japanese islands [4, p. 311]. The adoption of the basic traditional laws of Japanese aesthetics leads to a conscious unity of the concepts of a “human” and “harmony”.

Haruki Murakami is the author of modern Japanese literature, which has been translated into many languages of the world, which proves the interest of people in Japanese culture and the closeness of the author's syllable to the Western reader, which is not surprising, because the writer himself traveled for a long time and was able to see his country from afar. Haruki Murakami is a truly world author, because his works often make references to Western prose, songs, everyday life and travel in his works, which is atypical for a traditional Japanese writer. A feature of the writer's prose is the musical subtext of his creations, which shows the atmosphere and lyricism of the moments. A typical feature of this authentic author is the choice of an ordinary person without special goals as the main character, who just tries not to go crazy from the fuss that surrounds him. Generally, the Murakami's hero is a young man who is at the stage between a complete misunderstanding of his own “I” and full awareness of it. Haruki Murakami became a writer at the age of 29, this shows him as a person who consciously came to his life's work through experience and ambitions, like his characters, who tell about events in the past as sad memories that helped them to find themselves in ruins of previous life. In the novel “Norwegian wood”, the main character Watanabe is a university student, his life is ordinary and monotonous. Watanabe likes to travel alone, read books and listen to music, he loves and longs, and this reflects the essence of Japanese philosophy, which is called “the sad charm of things” (Japanese: “mono-no-aware”物の哀れ). This is an aesthetic principle in art, which began its development in the Edo period (17th–18th centuries) due to the renewed interest in Shintoism and its active dissemination. This notion is applicable to the entire culture of Japan, the most famous directions that were formed on its basis are the Japanese three-line Haiku and the traditional admiring of sakura in spring (Japanese: “hanami”) (Figure 1) [3, p. 147].

nothing lasts forever,  
snow and grass change in a year, life  
and death are like them  
(Morimura Seiichi's Haiku)



**Figure 1.** Traditional admiring of sakura in spring [3, p. 147].

The sad charm of things reminds a person that life is fleeting and cyclical, waiting is painful, and the moment is beautiful [2, p. 27]. This is what the main character of the Murakami's novel understands at the end of the labyrinth of his suffering. The writer often focuses on the tragedy of life and the loneliness of youth, which is why he constantly describes scenes in which the main character feels uncomfortable in a big crowd of people.

The lightness of Murakami's style gives the illusion of ease of perception of his works. At first glance, boring characters are combined with the genre of everyday life of the novel, that is named like the original song by the Beatles, can cause two feelings from the first reading. On the one hand, you get aesthetic pleasure from an infinite number of unique comparative turns, interesting musical pauses, and on the other hand, the lack of the protagonist's antagonist and a clear conclusion of the story can be a reason for most to consider the Japanese author's prose mediocre. Haruki Murakami does not just describe the daily life of the characters, he tries to convey the value of every moment, the importance of applying the principle of romanticization in his life, and also explains that one cannot live without thinking about death. Death in Japanese culture is an invisible part of life, not its completion. This thought is preceded by a whole layer of religious and philosophical reflections, which was replenished with such a symbolic name that is given to the novel, because the song "Norwegian wood" tells about a strange relationship between a guy and a girl. In the novel, the image of the wood is the dark soul of Naoko, the girl Watanabe loved. She couldn't find a way out of the symbolic trees. Midori is contrasted with Naoko. She is bright and optimistic, she is the personification of life in the novel, even the translation of her name from Japanese means green, that is the color of growth and development. The Surname Watanabe (yap. 渡辺, lit. – "at the ferry") also selected because of its meaning. Crossing between death and life – the choice before which the main character always was. The final scene is completely written in the style of "mono-no-avare", it is sad and beautiful, and the open ending shows that life goes on [1, p. 382].

The phenomenon of perfect imperfection appeared in the Land of the Rising Sun. This is the idea of that you need to accept life as it is, and not live in fantasies. In the science of language, "perfect" is something absolute and completed that has reached its peak. In other words, everything imperfect bears the signs of a living, developing. Thanks to Zen Buddhism, for six centuries there has been such a concept as "beauty in simplicity" (Japanese: "vabi-sabi"), which leads to distraction from the endless race for the ideal, helps to see beauty in natural things, to get closer to nature. This aesthetic concept also includes the concept of our existence. In the process of life, a person moves



from one stage to another: matures, ages and dies. Death is a natural process, there would be no development on the Earth without it. Wabi-sabi appears in kintsugi – the restoration of ceramic products, in the traditional tea ceremony, in ikebana – the traditional art of arranging cut flowers and even in the dim moonlight shining through the leaves of trees.

Consequently, the attitude of Japanese philosophers to life and death is the same. These concepts are harmonious, although they are opposite. A person is sensitive to ephemerality. Paradoxically, everything that does not last forever causes a desire to live [5, p. 50]. Researches on such topics will constantly replenish the theoretical base of philosophy, because all the answers to questions of concern to a person are subjective, which means they require additions or confirmation.

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### **ТРУДНОСТИ ПЕРЕВОДА ЮРИДИЧЕСКОЙ ТЕРМИНОЛОГИИ DIFFICULTIES OF LEGAL TERMINOLOGY TRANSLATION**

**Аннотация.** Данная статья посвящена детальному разбору особенностей перевода юридической терминологии. Перевод юридической терминологии представляет собой сложный процесс, в котором лицу, непосредственно осуществляющему такую деятельность, необходимо наличие знаний не только в лингвистической сфере, но и в юридической сферах. Особенно стоит обратить внимание на важность правильного, профессионального, грамотного перевода. Актуальность данной темы заключается в том, что грамотный

юридический перевод в связи с глобализацией, укреплением международного сотрудничества особенно востребован в современном мире и требует особой подготовки и собственного научного подхода.

**Abstract.** This article is devoted to a detailed analysis of the peculiarities of translation of legal terminology. Translation of legal terminology is a complex process in which the person directly performing such activities needs to have knowledge not only in the linguistic field but also in the legal field. The importance of a correct, professional, competent translation is worth paying special attention to. The relevance of this topic is that a competent legal translation in connection with globalization, the strengthening of international cooperation is especially in demand in the modern world and requires special training and own scientific approach.

**Ключевые слова:** юридический перевод, особенности перевода, юридический текст, юридическая термин, хорошее словосочетание, плохое словосочетание.

**Key words:** legal translation, translation features, legal text, legal term, good collocation, bad collocation.

Nowadays the English language is becoming more and more relevant, not only in the legal sphere, but also in modern communication, due to the strengthening and development of international relations, cooperation, which requires competent translation of international treaties, laws, international conventions and other legal documents. This topic is reflected in scientific works and articles of such people as: N.D. Golev, V.E. Usanov, T.N. Habeev, T.B. Zemljanaja, O.N. Pavlycheva and many others.

The study of language and law has developed into jurisprudence and linguo-legal studies, which indicates its dynamic development in Russia: “the relation of language to law is studied by jurisprudence, and of law to language by linguo-legal studies; the legal aspect of language is the subject of jurisprudence, linguistic aspects of law by linguo-legal studies” [2, p. 11–58]. The legal aspect, being “a very important subject of linguistic science” [3, p. 4–11], is a subject of study not only for linguists-translators, but also for students of higher educational institutions in the field of jurisprudence.

Legal translation is the translation of legal texts used to exchange legal information between people speaking different languages. Depending on the type of documents to be translated, legal translation is divided into:

- translation of laws and regulations;
- translation of contracts;
- translation of powers of attorney;
- translation of international treaties;
- judicial decisions;
- protocols;
- other legal documents.

The peculiarities of legal translation are clarity in the presentation of material, informativeness, availability of theoretical knowledge in the legal field, for the implementation of such a translation.

Legal term is a legal designation of a concept, with the help of which the content of a normative legal act is stated, and in turn are divided into commonly used (these terms are easy to understand, used in general designation “*document*”, “*contract*”), special technical (used by the legislator in the field of special knowledge – medicine, technology, for example “*euthanasia*”), specially – legal (terms arising in the process of phenomena, jurisdictional activity, for example “*prosecutor*”, “*legal relationship*”). According to the opinion of T.E. Alexeeva and L.N. Fedoseeva, according to the number of their components, terms can be divided into simple or one-component, for example “*adjudicate*” – to adjudicate, two-component, such as “*breaking and entering*” –



burglary and multi-component combinations, which consist of three or more words: “*being equipped to steal*” – to be ready to steal. [4, p. 344].

Simple terms are most commonly found in translation, by various kinds of formations:

- from a verb with a suffix: “*suspect – suspicion*”, “*punishment – punishment*”;
- from verbal nouns by means of a prefix: “*performance – non-performance*”, “*justice – injustice*”;
- from verbs by means of a null suffix: “*interrogate – interrogation*”.
- by means of the suffix “*robber – robbery*”;
- by adding two words: “*wrongdoing, blackmail*”;
- noun + conjunction + noun: “*breaking and entering*”;
- adjective + noun: “*fatal error*”;
- noun + preposition + noun: “*assisting an offender*”;
- verb + noun: “*accept liability*”;
- adverb + adjective “*highly contentious*” and more.

Also, many synonymous words that form similar phenomena can have different meanings in practice and will affect the qualification, so it is very important to have an extensive terminological base when translating: crime (преступление), felony (тяжкое уголовное преступление), offence (правонарушение, преступление), wrongdoing (правонарушение, преступление).

Today, specialized translation requires translators to have a thorough understanding of the original text, knowledge of the intricacies of scientific and literary language, as well as specialized vocabulary in the field of translation, because every missed or incorrectly translated word entails a misinterpretation of the essence of the contract. There is also the problem of using good collocation/bad collocation. When translating a term, it is necessary to choose the right collocation to match the official colloquial style. For example: to draft a contract – to write a contract (in this case it is correct to use to draft a contract), to honour a contract – to respect a contract (it is more correct to say to honour a contract), to breach a contract – to infringe a contract (in this case the word combination to breach a contract is used).

Many translators, at the beginning of their work, not having practical experience, are not able to understand the meaning of the sentence when they first read the text, because the language of interpretation of legal acts and legal documentation is quite complicated, so most often a mistake is made to translate the text word for word. In such a case there is a high probability that the original text will be distorted, and the meaning will not be conveyed correctly. In fiction translation, it is allowed to change the structure of a sentence in part, provided there are no violations of the rules of the target language. Moreover, grammatical transformations are simply necessary for quality, correct translation. Whereas in a legal translation, changing the sentence structure, word order, will change the content of the document, which is unacceptable. Only the legislator decides in what order and how to put the words in the text, in what order.

As mentioned above, legal translation can only be done by professional translators who specialize in legal translation. As a rule, they have an appropriate legal education or at least significant experience in legal translation. Nowadays, there are also certain criteria, which shall be adhered to in the process of translation:

- maximum accuracy, completeness in conveying the content of the term;
- generality of the term;
- the stability of the terminology;
- clarity.

When translating legal documents, it is necessary to take into account the existing differences in the legislation of countries, as well as the fact that “the terms enshrined in the norms of law denote only special normative concepts, and in this sense are unique in their content” [4]. In the Russian legal system, a lawyer is a general concept denoting a person with a higher or secondary legal education, who is competent to interpret and apply state laws. That is, it is the general name of the profession, which in turn is subdivided into specialties: lawyer, prosecutor, notary and many others. In the English system, the general notion of a person with a legal education is a lawyer. However,

when translating special terminology, we must pay attention to the fact that the use of the term *layer* in some cases is not accurate. For example, the *layer* is divided into profiles: *barrister* and *solicitor*. A *barrister* is a lawyer who handles court cases, prepares for court proceedings, appears in the High Court, the Court of Appeal, the Supreme Court, while a *solicitor* is a lawyer of a lower rank, who is mostly engaged in preparing legal documents, giving consultations, does not have such powers as a *barrister*. Also, to call a lawyer who specializes in a particular branch, for example, in family law, a general term *layer* would be inappropriate, because a more accurate name would be the concept of family lawyer.

Moreover, “the dependence of the text on the cultural characteristics and mentality of the people, as well as on its established legal system, can lead to the fact that the meaning of the text in the source language will not correspond to the meaning in the language of translation even with a completely literal interpretation”. [1, p. 29]. For example, in the English legal system there are such concepts as “*primaries*” – preliminary elections, “*venire*” – persons performing jury duty. There are also abbreviations such as ALJ – Administrative Law Judge, or CtApp – Court of Appeal. Such features a layman would not be able to understand at all. There are also different classifications of types of crimes, each of which has its own name. For example, consider the term “*theft*”, but burglary will be called “*burglary*”, and car theft will be called “*car theft*”, and there are many such nuances in the translation.

When translating legal texts, one must remember that many common words in legal texts may have a terminological meaning and one must use appropriate dictionaries and reference books in order to avoid the influence of one language on another, as well as correctly selecting the existing analogue in the language. All of this together proves that the translation of legal texts requires translators to be accurate, knowledgeable in the legal field and familiar with the legal and cultural aspects of the country. Otherwise, errors can occur in the process of translation, which can lead to material damage and legal action. In conclusion, I would like to add that translation is undoubtedly a very complex process that requires special training and the demand for which is constantly growing.

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**ПРОБЛЕМА ПЕРЕВОДА НАЗВАНИЙ ОБЪЕКТОВ  
КУЛЬТУРНОГО НАСЛЕДИЯ СЕВАСТОПОЛЯ  
THE PROBLEM OF TRANSLATING THE NAMES OF  
SEVASTOPOL'S CULTURAL HERITAGE OBJECTS**

**Аннотация.** Данная статья посвящена проблеме перевода названий объектов культурного наследия Севастополя. Даны определения терминам: культурное наследие, объекты культурного наследия, также перечислены наиболее распространенные способы перевода имен собственных: транслитерация, транскрипция, калькирование. Акцент делается на переводе самых ярких и известных достопримечательностей города Севастополя, непосредственно связанных с его историей. Анализируются примеры ошибок на указателях, расположенных в центре города, а также на туристических сайтах при их переводе с русского языка на английский с использованием метода калькирования. Большое внимание уделяется пониманию когнитивного контекста при переводе имен собственных. Сделан вывод о том, что администрация города должна обращаться за помощью к опытным переводчикам во избежание ошибок.

**Abstract.** This article is devoted to the problem of translating the names of Sevastopol's cultural heritage objects. The author defines such terms as cultural heritage, objects of cultural heritage, as well as describes the most common ways of translating proper names: transliteration, transcription, calque. The emphasis is on translating the most striking and famous Sevastopol sights, directly related to the city history. Examples of mistakes on road signs located in the city center, as well as on tourist sites are analyzed when they are translated from Russian into English using calque. Much attention is paid to understanding the cognitive context in translating the proper names. It was concluded that the city authorities should ask experienced translators for help in order to avoid mistakes.

**Ключевые слова:** перевод имен собственных, транслитерация, транскрипция, калькирование, объекты культурного наследия.

**Key words:** translating of proper names, transliteration, transcription, calque, the cultural heritage objects

The problem of the proper names' translation is relevant, in particular, the interpretation of toponyms, hidronyms and names of tourist object presents a great interest for both historians and linguists. These names take an important place in the language system and their study can tell a lot about formation of language and culture, keeping traditions and customs. Thus, the purpose of this article is to analyze the translation of some objects of the cultural heritage of Sevastopol to identify the most suitable variant.

Like all elements of a language, geographical names are subject to certain laws of the language and for this reason must be studied by linguists. Long-term research experience has shown that the connection between historical geography and toponyms is inseparable. It is very important to preserve the cognitive context when translating common nouns such as toponyms, geographical objects, cultural heritage objects. These proper names reflect and preserve the culture of a certain community, these features must be translated into other languages so that a person of another nation can understand what they stand for.

To begin with, let's consider the subject of the given study. "Cultural heritage" is a part of the material and spiritual culture created by past generations, which passed on to generations as something valuable and revered [2]. "Objects of cultural heritage" are the sights that tell us about history, culture and are the objects of tourist visiting [2].

The most common techniques for translating proper names are transcription, transliteration and calque.

Transcription and transliteration are ways of translating the lexical unit of the original by recreating its form using the letters of the first language. During transcription, the sound form of a foreign language word is reproduced, while in transliteration, it is the graphic form (letter composition) [1].

Calque is a translation technique in which a word or expression is broken down into components, and each element is translated separately [1].

The given techniques are widely used in interpretation of toponyms and names of cultural heritage objects. Although the first two ways are mostly clear, even there some controversial cases might take place. Calque has more interpretation problems than the others. That is because during translation of definitions and certain concepts, it is necessary to understand the cognitive context. These problems are especially relevant for Sevastopol. Let's look at the most common mistakes in translating the names of Sevastopol cultural objects.

1. Art-Bay [3]

This shortening comes from Artillery Bay. However, in English the word "art" has a certain meaning: "the use of the imagination to express ideas or feelings, particularly in painting, drawing or sculpture" [4]. This notion was also borrowed by modern Russian, so now it is even necessary to explain this name to the native speaker, to say nothing of the foreigner. That is why in this name it is important to use the full form of the proper name, otherwise the main meaning is lost.

2. Grafskaya Pier

You can see such inscription on the signpost in the city center. But it is not correct. In reality this object represents stages, descending to the dock on the ground. So, this is not a pier, this is landing place. According to the Oxford Learner's Dictionaries, pier is "a long structure built in the sea and joined to the land at one end, often with places of entertainment on it" [4]. The correct translation of this sight should sound like this: Grafskaya landing place or Grafskaya landing stage.

3. The Monument to the Sunken Ships [5]

The verb "to sink", which is used on the pointer, is defined as the action of sinking the vessel by an opponent or enemy, while the verb "to scuttle" means "filling the ship with water until the loss of buoyancy, carried out by order of the superior command or the commander of the ship" [4]. Considering the history of this monument and its Russian variant, the correct name for this attraction is "The Monument to the Scuttled Ships".

In conclusion I would like to say, that it is necessary that every city authorities should use specialists when translating such names and especially when putting them to the street signs. The translation should be performed by those people, who can understand and identify the cognitive context.

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**«ВОЛШЕБНЫЙ КРАЙ» А.С. ПУШКИНА:  
КРЫМ В ЛИТЕРАТУРНОЙ СУДЬБЕ ПОЭТА  
“THE MAGIC LAND” OF A.S. PUSHKIN:  
CRIMEA IN THE POET'S LITERARY DESTINY**

**Аннотация.** В данной статье рассматриваются особенности крымского периода жизни и творчества А.С. Пушкина. Автор называет причины, побудившие поэта совершить путешествие по крымскому полуострову, и приводит «итинерарий» – описание маршрута с указанием промежуточных стоянок. Основная часть работы посвящена изучению произведений из «крымского цикла» Пушкина и их переводов на французский язык. В статье представлены наиболее яркие произведения, установлены место и условия их создания, а также приведен их анализ на сюжетном уровне. В заключительной части автор приходит к выводу, что в поэтических строках Пушкина оригинально представлены известные места полуострова, детально воссозданы картины природы, жизнь и нравы Крыма XIX века. Кроме

того, автор заключает, что произведения «крымского цикла» довольно многочисленны, однако в переводах на французский язык представлены очень ограниченно, что объясняется трудностями перевода, связанных со спецификой авторского стиля.

**Abstract.** This article examines the peculiarities of A.S. Pushkin's life and work during the Crimean period. The author names the reasons that prompted the poet to make a trip around the Crimean peninsula and gives an “itinerarium” – a description of the route with indication of stopping sites. The main part of the work is devoted to the study of works from Pushkin's “Crimean cycle” and their translations into French. The article contains the most representative works, establishes the place and conditions of their creation and provides their analysis at the plot level. In the final part, the author comes to the conclusion that in Pushkin's poetic lines the famous places of the peninsula are presented in an original way, the pictures of nature, life and customs of the Crimea of the XIX century are recreated in detail. Moreover, the author concludes that the works of the “Crimean cycle” are quite numerous, but they are very limited in translations into French, which can be explained by translation difficulties associated with the specifics of the author's style.

**Ключевые слова:** А.С. Пушкин, «крымский цикл», литературная экскурсия, французский язык.

**Key words:** A.S. Pushkin, “Crimean cycle”, literary excursion, French.

Dans le thème des excursions littéraires en Crimée, l'histoire du séjour de “lumière de la poésie russe” sur la péninsule est presque la plus importante et la plus discutée. Le court séjour du poète en Crimée a laissé une marque significative dans la biographie littéraire du poète. Les ethnographes ont compté que pendant son voyage, Alexandre Sergueïevitch a visité plus de 50 localités, a parcouru 650 kilomètres en calèche, à cheval et à pied et encore 150 kilomètres en mer. Les réalités de Crimée se reflètent dans trois douzaines d'œuvres, ces œuvres sont conditionnellement combinées dans le “cycle de Crimée” de Pouchkine.

Compte tenu de l'importance de la figure de Pouchkine dans la littérature nationale et étrangère, il faut fixer attention sur les traductions des œuvres du poète en langues étrangères. Le but de ce travail est de déterminer quelles œuvres appartiennent au “cycle de Crimée” et de trouver leurs traductions en français. Pour atteindre ce but, il est nécessaire de relever les objectifs suivants:

- 1) établir les particularités de la biographie de Crimée de Pouchkine;
- 2) composer l'itinéraire du poète avec indication des aires de stationnement;
- 3) allouer les œuvres créées pendant le voyage de Crimée; établir où, quand et dans quelles circonstances elles ont été écrites, trouver leurs traductions en français;
- 4) déterminer quelle place la Crimée occupe dans le destin littéraire du poète.

Au printemps de 1820, Pouchkine a été critiqué pour ses poèmes dénigrant le statut d'un fonctionnaire d'état (le poète était officiellement inscrit au Collège des affaires étrangères): il écrivait très souvent des acuités et des épigrammes par rapport aux hautes personnes. Cela a provoqué le mécontentement de l'empereur Alexandre I. Le poète a été menacé par la Sibérie ou des années de pénitence au monastère de Solovetsky. C'est l'intercession des amis de Pouchkine (Karamzin, Joukovski, Chaadaev) qui a atténué la colère du monarque. Le poète a été envoyé en exil au Sud - à Ekaterinoslav (aujourd'hui Dnepropetrovsk). Mais quelque temps plus tard, il tombe malade, souffre de fièvre, et le chef de Pouchkine, montrant de la compassion, permet à l'exilé de voyager un peu.

Pouchkine rêvait de ce voyage en Crimée. Il l'a fait en août-septembre 1820. Et quand il a vu les paysages magnifiques, quand il a senti la vie insouciant du sud, il ne pouvait pas s'empêcher d'écrire sa poésie. En Crimée, la muse ne l'a jamais quitté, et aujourd'hui nous disposons de nombreuses œuvres appelés le “cycle de Crimée”.

Le voyage de trois semaines de Pouchkine a commencé par une traversée du détroit de Kertch en août 1820. Mais Kertch n'a pas fait une grande impression sur le poète. Feodosia, elle aussi, lui semblait ennuyeuse et ne se reflétait pas dans ses œuvres.

Deux jours plus tard, le voyageur est arrivé à Gurzuf qui lui apparaissait "le rayonnement multicolore des montagnes". La même nuit, Pouchkine a écrit le célèbre poème "La lumière du jour s'est éteinte..." («Погасло дневное светило»). Dans ce poème, on voit un paysage de nuit, avec la mer dans le brouillard. En l'admirant l'auteur essaie de comprendre la nature de l'univers et trouver en lui une place pour une personne. Cette œuvre est une élégie qui jette sur les réflexions du héros lyrique sur sa vie et son propre destin.

Dix ans plus tard, Pouchkine a recréé l'apparence de la Tauride dans "Les Voyages d'Onéguine". Comme les textes de Pouchkine sont très difficiles à traduire la traduction est présentée en prose:

*Прекрасны вы, берега Тавриды,  
Когда вас видишь с корабля  
При свете утренней Киприды,  
Как вас впервой увидел я;  
Вы мне предстали в блеске брачном;  
На небе синем и прозрачном  
Сияли груди ваших гор,  
Долин, деревьев, сёл узор  
Разостлан был передо мною,  
А там, меж хиженок татар...  
Какой во мне проснулся жар!*

*Vous êtes charmans, rivages de la Tauride,  
lorsqu'on vous voit, à bord d'un bâtiment, à  
la faveur de la belle Cypris, comme je vous  
vis pour la première fois; vous m'apparûtes  
dans l'éclat d'une jeune mariée, les  
sommets de vos masses de montagnes  
brillaient sous un ciel bleu et transparent;  
devant moi se déroulait le tableau des  
vallées, des arbres et des campagnes. Et là,  
parmi les pauvres chaumières des Tatares...  
quelle chaleur s'empara de moi! [4, p. 208].*

Gurzuf est un coin béni où Pouchkine était vraiment heureux, dont il a dit à son frère dans ses lettres: "J'ai adoré écouter le bruit de la mer – et j'ai écouté pendant des heures. Un cyprès poussait à deux pas de la maison; chaque matin je lui rendais visite et je m'attachais à lui avec un sentiment proche de l'amitié" («Я любил слушать шум моря - и заслушивался целые часы. В двух шагах от дома рос молодой кипарис; каждое утро я навещал его и к нему привязался чувством, похожим на дружество»).

A Gurzuf, le poète "nageait dans la mer, gorgéait de raisins" («купался в море, объедался виноградом»), admirait la charme de la nature. Trouvant la romantique dans les choses les plus prosaïques, Pouchkine a décrit le bain d'une jeune fille, la regardant secrètement du côté du parc:

*Среди зеленых волн, лобзающих Тавриду,  
На утренней заре я видел Нереиду.  
Сокрытый меж дерев, едва я смел дохнуть:  
Над ясной влагою полубогиня грудь  
Младую, белую, как лебедь, воздымала  
И пену из власов струею выжимала.*

*Au milieu des flots verts qui baisent la Tauride  
A la pointe du jour j'ai vu la Néréïde.  
Caché dans un buisson, je n'osais respire.  
Au-dessus de l'eau Claire ont paru se lever  
Des seins blancs comme cygnet et la jeune déesse  
Faisait jaillir en pleurs l'écume de sa tresse.  
[2, p. 50]*

A Gurzuf un autre poème – "Prisonnier du Caucase" – a été commencé. Sous l'influence des impressions de Crimée, plusieurs poèmes ont été écrits.

Mais les jours de repos au bord de la mer sont terminés, et au début de septembre 1820 Pouchkine continue son voyage le long de la côte sud. Il visite le jardin botanique Nikitsky, les ruines de la forteresse de Palekastro et s'arrête à Yalta. Et après, le poète arrive à Bakhchissaraï. La ville a impressionné le poète dès le début, quand elle est apparu du coin de la rue. Ici, Pouchkine arrive malade avec de la fièvre. Mais malgré la maladie, la muse ne le quitte pas. Les traces de l'observation aiguë du poète peuvent être trouvées dans les détails de la vie quotidienne reproduits dans le poème "La Fontaine de Bakhchissaraï". On sait que les femmes tatares étaient traditionnellement obligées

rester à la maison, et les voyageurs notaient le vide dans les rues de Bakhchissaraï. Mais nous lisons Pouchkine:

*Покрыты белой пеленой,  
Как тени легкие мелькая,  
По улицам Бахчисарая  
Из дома в дом, одна к другой,  
Простых татар спешат супруги  
Делить вечерние досуги.*

*Les femmes des simples Tatars, couvertes d'un  
voile blanc, passent comme des ombres légères  
dans les rues de Bakhchissaraï, de maison en  
maison, les unes chez les autres, pour partager  
les loisirs du soir [4, p. 314].*

Est-ce que Pouchkine s'est trompé? Il s'avère que non: le poète a visité la ville le deuxième jour de la fête musulmane de Qurban Bayram, lorsque les femmes ont été autorisées à rendre visite à leurs voisins et proches pour déguster des friandises festives. Le poète russe s'est retrouvé au centre de l'amusement de tous, voyant pour la première fois les anciens jeux tatars, les compétitions équestres, reflétés plus tard dans le poème "Prisonnier du Caucase".

Contrairement aux fêtes orientales, l'attraction principale de la ville – le palais du khan – n'a pas répondu aux attentes. Dans sa lettre, le poète écrit: "Je me suis promené dans le palais avec une grande contrariété à cause de la négligence dans laquelle il se dégrade. J'ai vu une fontaine en ruine, de l'eau coulait d'un tuyau rouillé" («Я обошел дворец с большой досадой на небрежение, в котором он истлевают. Увидел я испорченный фонтан, из заржавленной трубки капала вода»). Le poète a visité le harem, notant seulement le délabrement de la structure autrefois luxueuse. Pendant sa promenade Pouchkine a entendu la vieille légende de l'amour de Khan Giray pour Maria Pototskaya. La princesse polonaise était sa captive dans le palais de Bakhchissaraï. Mais le Khan, lui aussi, était prisonnier de sa beauté. La belle mourut de la jalousie de la femme du Khan. Giray s'occupa cruellement de son épouse et à la mémoire de Marie installa une fontaine-monument en marbre, qui fut surnommée "la fontaine des larmes". On dit que cette fontaine pleurera éternellement en souvenir de l'aimée. Pouchkine a été très impressionné par cette légende. Quatre ans plus tard, il est retourné mentalement en Crimée, ses lignes émotionnelles sont consacrées au "tuyau rouillé", incarnant l'idée d'un chagrin éternel à propos de l'amour morte.

*Фонтан любви, фонтан живой!  
Принес я в дар тебе две розы.  
Люблю немолчный говор твой  
И поэтические слезы.*

*Fontaine d'amour, fontaine de vie!  
Je t'ai apporté deux roses en cadeau.  
J'aime ton murmure incessant  
Et tes larmes poétiques  
[2, p. 30].*

Il faut noter qu'à la mémoire de Pouchkine, sur le rebord de la fontaine il y a toujours deux roses - blanche et rouge.

Balaklava est devenu le dernier point sur le chemin du poète. Pas loin du village se trouve le monastère Saint-Georges. Pouchkine l'a visité et puis s'est dirigé vers le cap Fiolent. Selon la légende, il y avait les restes du temple de la déesse Diane-Artémide (dans la mythologie antique - la déesse de la lune, la patronne de la chasse). Pouchkine écrit: "Immédiatement j'ai vu les ruines du temple de Diane. Ici les rimes m'ont rendu visite" («Тут же видел я развалины храма Дианы. Тут посетили меня рифмы»).

Avant de quitter la Crimée, le poète restait un peu à Simferopol. Il n'a laissé aucune note sur cette ville, on ne sait pas donc quelles étaient ses impressions. C'était la dernière ville de Crimée visitée par Pouchkine.

Le poète a quitté la Crimée à la mi-septembre avec l'espoir de revenir. Mais il n'est revenu jamais. Cette région était l'un des rares endroits où Pouchkine était vraiment heureux. Il n'avait jamais connu une telle tranquillité d'esprit et une telle liberté de création. Ici, il a vu la mer pour la première fois, et chaque impression était forte et inoubliable. La péninsule a toujours été chère au cœur de Pouchkine. Il a écrit les lignes magnifiques. Nous les avons en prose:



*Поклонник муз, поклонник мира,  
Забыв и славу и любовь,  
О, скоро вас увижу вновь,  
Брега веселые Салгира!  
Приду на склон приморских гор,  
Воспоминаний тайных полный,*

—  
*И вновь таврические волны  
Обрадуют мой жадный взор.  
Волишебный край! очей отрада!  
Все живо там: холмы, леса,  
Янтарь и яхонт винограда,  
Долин приютная краса,  
И струй и тополей прохлада...  
Всё чувство путника манит,  
Когда, в час утра безмятежный,  
В горах, дорогою прибрежной,  
Привычный конь его бежит,  
И зеленеющая влага  
Пред ним и блещет и шумит  
Вокруг утесов Аю-Дага...*

*Adorateur des Muses, adorateurs de la  
paix, oubliant l'amour et la gloire, oh! je  
vous reverrai bientôt, rivages rians de  
Salguir! je viendrai sur les penchans des  
montagnes maritimes, bercé de  
souvenirs secrets, et les flots de la  
Tauride charmeront de nouveau mon  
avide regard. Contrée magique, Bonheur  
des sens! tout y est vivant: les collines,  
les bois, l'ambre, et le raisin doré,  
beauté solitaire des vallées, fraîcheur  
des eaux et des peupliers, tout y attire  
l'attention du voyageur lorsque, dans  
une belle matinee, son coursier s'avance  
comme à son ordinaire au pied des  
collines, en suivant le sentier sur le  
ravage, et que l'eau azurée brille et  
murmure à ses yeux autour des roches  
Ajou-Dag... [4, p. 322].*

Alors, dans les lignes poétiques de Pouchkine, les lieux célèbres de Tauride sont présentés de manière originale; la nature, la vie et les mœurs de la Crimée de cette époque sont décrites en détail. La Crimée de Pouchkine est une terre brillante, gentille et romantique. La mer, les montagnes, l'éclat du soleil du Sud, la beauté majestueuse des paysages – ces images sont entrées dans les poèmes du “cycle de Crimée”, ils ont constitué l'arrière-plan des célèbres poèmes “Prisonnier du Caucase”, “La Fontaine de Bakhchissaraï” et “Tauride”. De plus, le poète a associé l'idée d’”Eugène Onéguine” avec la Crimée, appelant cette terre le berceau du personnage principal. Pouchkine a forcé la Russie à regarder cette région d'une nouvelle manière, a approuvé son importance historique et culturelle. En mémoire du grand poète et de sa visite en Crimée, plusieurs monuments, panneaux commémoratifs ont été installés, des rues, des places, des boulevards portent son nom.

Les œuvres du “cycle de Crimée” sont nombreuses (en trois semaines passées en Crimée Pouchkine a écrit plus de 30 œuvres) mais les traductions en français sont assez limitées. Cela s'explique par les difficultés de traduction liées aux spécificités du style de l'auteur. À l'avenir, on va procéder à une analyse linguistique des textes originaux et traduits et étudier le problème du point de vue de la théorie de la traduction.

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## **ОСОБЕННОСТИ РЕЧЕВОГО РАЗВИТИЯ ДЕТЕЙ-БИЛИНГВОВ** **FEATURES OF SPEECH DEVELOPMENT IN BILINGUAL CHILDREN**

**Аннотация.** Современный, стремительно развивающийся мир, в котором мы живем, значительно расширяет, а порой и совсем стирает границы, в том числе и этнические, языковые. В настоящее время большое количество детей растут и развиваются в двуязычной среде. Двуязычие, или билингвизм, положительно влияет на умственные способности ребенка, активизирует его общеязыковые и переводческие способности. Ребенок легче адаптируется к новой социальной и культурной среде. В современном мире знание нескольких иностранных языков дает большое преимущество в профессиональной, образовательной и социальной деятельности. В данной статье рассматриваются особенности речевого развития двуязычных детей, анализируются подходы различных ученых к данному вопросу. Приводятся наиболее распространенные речевые и языковые трудности детей-билингвов. Также рассматривается вопрос отрицательного влияния двуязычия на формирование речи ребенка.

**Abstract.** The modern, rapidly developing world in which we live significantly expands, and sometimes completely erases borders, including ethnic and linguistic ones. Currently, a large number of children grow and develop in a bilingual environment. Bilingualism, or bilingualism, has a positive effect on the mental abilities of a child, activates his general language and translation abilities. The child adapts more easily to the new social and cultural environment. In the modern world, knowledge of several foreign languages gives a great advantage in professional, educational and social activities. This article examines the features of the speech development of bilingual children, analyzes the approaches of various scientists to this issue and gives the most common speech and language difficulties of bilingual children. The issue of the negative influence of bilingualism on the formation of a child's speech is also considered.

**Ключевые слова:** язык, ошибки, билингвизм, речевое развитие, дети-билингвы, двуязычие, нарушение речевого развития.

**Key words:** language, mistakes, bilingualism, speech development, bilingual children, bilingualism, impaired speech development.

Bilingualism or bilingualism in a broad sense is understood as the ability of an individual to use two or more languages in communication (the latter case is often singled out as a separate category of multilingualism). Speakers of two or more languages are called bilinguals [5, p. 78]. To begin with, let us turn to the definition of the concept of speech activity.

Speech activity is a specific form of activity that is formed and developed on the basis of certain prerequisites (biological, genetic, social) and manifests itself through the general speech ability. This speech ability can be viewed as a readiness for education and operation with a sign system, which can be identified in the conditions of the relationship “person-thing, object”, “person (child)-adult” [2, p. 51].

Bilingual children represent a special group in the category of preschoolers and primary school children with underdevelopment or speech impairment. For speech therapy, bilingualism is of particular interest because the factor of bilingualism is an aggravating factor, since it is often the cause of speech pathology, which, in turn, affects the development of the cognitive sphere and prevents the social adaptation of a bilingual child [3].

By analyzing mistakes in mastering the native language, one can obtain the information necessary to identify the features of the process of generating and understanding speech, modeling the named processes; as well as to study the structure of the mental vocabulary, discover the patterns of mastering the native language and organize the teaching of this language as a non-native language [2, p. 51]. As noted by A.A. Leont'ev, in the human speech mechanism, an error is most often interpreted as a signal of a “split seam” [4, p. 78]. Most researchers are trying to find out what types of errors are associated with certain stages of the speech-thinking process. The human brain has an innate ability to acquire a language, which persists even after mastering the first (native) language. The student actively builds his own “grammar” of a non-native language, similar to how it is done when mastering the first language. And very often, for mastering both languages, some strategies are common.

Errors are a source of information about the process of mastering a foreign language and the organization of the process of teaching this language as a foreign language. Several bugs are highlighted. The first-they can be called reservations are understood as the facts of oversights in the flow of speech due to fatigue, excitement, etc., when a quick self-correction is possible on the part of the speaker. The latter include typical deviations from the rules of a non-native language, that is, mistakes that are made by students in the course of mastering the language and do not lend themselves to self-correction.

A certain number of errors in a non-native language can be explained by the influence of the native one. These errors are classified as cross-lingual, i.e. errors of interlingual interference. Quite often there are the same mistakes that non-native language learners make, regardless of the nature of their native language. Errors of this kind are called intralingual, which reflect the specifics of the process of mastering the language, the course of this process. They show similarities with the mistakes that take place in the acquisition of a language by its speakers in the process of ontogenesis [2, p. 51]. V.A. Vinogradov noted that “... the mechanism of errors is fundamentally identical for the process of acquiring a language by a child and for the process of learning a second language by adults” [1, p. 56].

Having analyzed the speech and language difficulties of bilingual children of senior preschool age and younger schoolchildren, we can identify the most common features of language development in the acquisition of Russian in bilingual children:

1. They make a large number of spelling mistakes in simple words

2. They have an incorrect or unstable sound pronunciation in Russian, since the influence of the second language system does not allow the correct sound image to be fixed.
3. The language model of the native language is transferred to Russian:  
Incorrectly use case endings.
4. When retelling a text or an independent story, a limited set of words is most often used.
5. Do not learn the intonation of the Russian language, etc.

Intonation, as one of the most important components of speech, which plays a special role in learning, is acquired by a child very early. We can say that it is she who determines the belonging of a person to a particular national language. Mastering intonation structures is difficult for bilingual children, and often without special training, intonation cannot be fully mastered by this category of children.

For children of senior preschool and primary school age who speak the same Russian language and do not have any speech pathologies, such errors are not typical [6, p. 165–167].

Summing up the above, it can be argued that a child who masters two or more languages at the same time goes through a difficult path of both speech and mental development. The problem of bilingualism affects all aspects of the formation of a child's personality. Family influence is critical to human development. Since speech is the main communicative function, its impairment or insufficient assimilation can adversely affect the quality of human life.

Therefore, on the one hand, bilingualism is a risk factor for the occurrence of speech disorders (for example, it is often the acquisition of two languages that simultaneously becomes the cause of stuttering or delayed speech development), on the other hand, the presence of pathological speech disorders makes it difficult to perceive and use both native and foreign languages.

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## **ГЕНДЕРНАЯ НЕЙТРАЛЬНОСТЬ В АНГЛИЙСКОМ ЯЗЫКЕ GENDER NEUTRALITY IN THE ENGLISH LANGUAGE**

**Аннотация.** В статье исследуется тенденция английского языка к переходу от гендерно-ориентированного к гендерно-нейтральному языку. Важнейший фактор этих изменений – увеличившаяся роль феминизма и борьбы за равные права в современном мире. В ходе исследования анализируются лексические и грамматические изменения в языке, вызванные этим переходом. Автор работы анализирует гендерно-нейтральные термины, такие как названия профессий, и способы их образования. Также в статье приводится сравнение гендерно-нейтральных местоимений с целью выявления наиболее оптимального и удобного в использовании местоимения третьего лица единственного числа, не указывающего на гендерную принадлежность, и рассматриваются примеры их использования на практике. В работе характеризуется влияние языка на общество и роль гендерно-нейтрального языка в борьбе против гендерных стереотипов. Язык не только отражает реальность, но и влияет на неё, поэтому язык может как помогать в борьбе за гендерное равноправие, так и поддерживать сексизм и гендерные стереотипы в обществе.

**Abstract.** The article studies the tendency of the English language to shift from gender-specific to gender-neutral language. The main cause of these changes is the increasing role of feminism and the fight for gender equality in the modern world. The paper demonstrates the lexical and grammatical changes in the language caused by that shift. The author analyzes gender-neutral terms, such as job titles, and ways of their formation. The article compares gender-neutral pronouns in order to find the most appropriate third-person singular pronoun that does not refer to any gender. It also introduces the examples of their practical use. The study provides insight into the influence of language on the society and the role of gender-neutral language in the fight against gender stereotypes. Language does not only reflect reality, but it affects it as well. That is why it can help fight for gender equality or contribute to sexism and gender stereotypes in society.

**Ключевые слова:** лингвистика, гендерно-нейтральный язык, гендерное равноправие, местоимения, гендерология.

**Key words:** linguistics, gender-neutral language, gender equality, pronouns, gender studies.

Gender studies is an actively developing discipline that was founded due to the changing society and its demand for gender equality. There is an undeniable connection between gender and language, it's an interdisciplinary academic field of research that studies varieties of speech and writing in terms of gender, gender relations and practices.

The absence of a gender-neutral third person singular pronoun in English grammar has been an actively discussed problem for over a hundred years. However, the situation has intensified recently due to some changes in society. The main cause may be the influence of early American feminism and their fight for gender equality. The focus has shifted to the linguistic aspect, and a male-oriented view of the world has become widely criticized. That led to the request for unbiased language.

Gender-neutral language, also known as gender-inclusive language, is the practice of using words that do not give an idea of someone being male or female. In other words, it's a language that avoids bias to a particular sex or social gender.

According to a guideline to gender-neutral language by the European Parliament, gender-neutral language is about more than just political correctness [1, p. 3]. Language shapes the way we think and it affects reality, that it is why it is so important to use gender-neutral language that avoids implying that one gender is the norm.

One of the ways to stay gender-inclusive is to make changes in lexicology by avoiding using gender-specific terms, such as job titles. Some titles do not refer to any gender. For example, doctor, teacher, interpreter, etc.

However, job titles ending with “-man”, such as policeman, fireman, chairman, imply masculine connotation and often reinforce stereotypes about the person we expect to see. It can be fixed by replacing “-man” with “-woman”. That way we get chairwoman, policewoman, firewoman, etc. But what if the gender of the person is unknown? The linguistic strategy here is neutralization: the endings “-man” and “-woman” are replaced by “-person” or other fitting endings (e.g. chairperson, more examples can be found in table 1). That way gender references can be avoided. As for the words “waiter” and “waitress”, it is impossible to change them, but they can be replaced with the word “server”, as well as “stewardess” and “steward” can be replaced with “flight attendant”

**Table 1.** Gender-neutral job titles

| Gender-Based | Gender-Neutral              |
|--------------|-----------------------------|
| chairman     | chairperson                 |
| cameraman    | camera operator             |
| policeman    | police officer              |
| fireman      | firefighter                 |
| mailman      | mail carrier, postal worker |
| waitress     | server                      |
| stewardess   | flight attendant            |

It is easier to use gender-neutral terms instead of wondering about the gender of the person in fear of misgendering them (identifying one's gender incorrectly) or, according to the Linguistic Economy Principle, adding gender markers to job titles.

So, the English lexicology has undergone many changes and has shifted from being gender-specific to gradually becoming gender-neutral. However, there is still a lot to be discussed in the field of English pronouns. The English language still does not have a third-person singular pronoun that could be used to refer to anyone regardless of the gender.

Though in cases when the gender of the person is unspecified, it is acceptable to say "he or she" and in written language "he/she" or "s(he)" can be used. However, according to the rules, it cannot be used twice in one sentence. It also goes against the rule of the Linguistic Economy Principle as it is easier to use one pronoun instead of saying "he or she". That is why the English language is in need of a gender-neutral pronoun.

Generic pronouns are another tool of gender-neutral language. A generic pronoun is a personal pronoun that can refer to both masculine and feminine entities.

In the past, the masculine pronoun "he" was considered generic and was acceptable for both sexes: male and female. This rule is still widely used in modern English. For example, hearing the word "customer", a person imagines a man, not a woman, therefore, says "he", referring to a customer. It excludes women and contributes to a male-oriented view of the world. According to Crum, "the masculine pronouns and possessives are usually employed for persons without regard to sex wherever the antecedent has a general indefinite meaning" [1, p. 221]. So, an indefinite subject can be followed by "he", which implies both men and women. For example, "If anyone did not know it, it was his own fault" (George Washington Cable, "Old Creole Days", 1879).

However, the feminine pronoun "she" can be also used as a generic pronoun. But it is a very rare occurrence and it is mostly used when the text or speech is targeted at mostly female audience or when it is likely that the subject is female. Nevertheless, neither "he", nor "she" can be considered gender-neutral.

However, there is a third-person singular pronoun that is considered completely gender-neutral. It's the pronoun *one*. It can be applied to both female and male sexes. But it is used to refer not to the listener or a specific person, but to people in general. Sometimes it can be used instead of "you", "we" or "everyone". It is used in instructions, rules, advice or general statements. For example, "One must learn from one's mistakes", "The speaker was awful: one was embarrassed for him", "One does not simply walk into Mordor" (The Fellowship of the Ring, 2011).

But "one" is considered outdated and too formal, it does not sound appropriate or natural in everyday conversations. So, it is not the ultimate gender-neutral pronoun and it does not fill the gap of the missing gender-neutral third-person singular pronoun in English.

Recently there has been an increasing tendency to use a singular "they" as a gender-neutral pronoun. In the past, it was only used in formal speech, but now it is actively used in informal speech as well, referring to a subject with an unspecified gender. This tendency came from American English and it is considered controversial, causing discussions among linguists. Nevertheless, it significantly simplifies the language and saves people the trouble of dwelling on whether to use feminine or masculine pronouns if the gender is unknown.

Though it may seem confusing from the grammatical point of view. What rules are applied here? Should it be used as singular or remain plural? But the rules are simple:

- Use a plural verb form with the singular pronoun "they" ("they are", "they go" not "they is", "they goes").

- Both "themselves" and "themselves" are acceptable as reflexive singular pronouns, but "themselves" is currently the more common usage and "themselves" can be considered a neologism [2, p. 11].

The examples of using the singular pronoun *they* can be found in everyday informal speech. For example, "Who left their umbrella here? They should come back to look for it", "Everyone thinks they know everything". These sentences sound natural and we can hear them every day. A singular

they was also used in classical literature: “Every one must judge according to their own feelings” (Lord Byron, “Werner”, 1823).

Nevertheless, not everyone accepts a singular they as a fitting generic pronoun. The Chicago Manual of Style (2010) says “although they and their have become common in formal usage, neither is considered acceptable in formal writing, so unless you are given guidelines to the contrary, do not use them in a singular sense” [3].

Though it was stated that the discussion of this matter had intensified recently, the problem is not new. Decades ago, people tried to keep their speech and writing gender-inclusive, too. However, sometimes it only made things more complicated.

“Following a head injury, have the patient lie down and remain completely quiet no matter how she feels. Have him do this even though he acts all right and insists that you leave her alone. Keep the patient flat on his back (or face down if he’s vomiting) if her face is gray, blue, or pale”

It’s an extract from the Albuquerque Journal published in 1976. The author tried to keep the text gender-neutral by alternating feminine and masculine pronouns, but it only made it hard to read and understand. But it can be easily fixed by replacing inconsistent male and female pronouns with one gender-neutral pronoun. A singular they seem like the perfect solution.

“Following a head injury, have the patient lie down and remain completely quiet no matter how they feel. Have them do this even though they act all right and insist that you leave them alone. Keep the patient flat on their back (or face down if they’re vomiting) if their face is gray, blue, or pale”

Now, the text is no longer confusing. The replacement helped to make it easier to understand and it kept the text gender-neutral.

The world and society change very fast and these changes influence the language. Gender-neutral language is important nowadays, when the fight for gender equality is stronger than ever, and these changes are a natural response to the changes in society. It essentially contributes to the fight for gender equality and makes the language comfortable for people of all identities.

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**ВЛИЯНИЕ ГРЕКОВ НА ИБЕРИЙСКИЙ ПОЛУОСТРОВ И ИСПАНСКИЙ ЯЗЫК**  
**GREEK IMPACT ON THE IBERIAN PENINSULA AND**  
**THE SPANISH LANGUAGE**

**Аннотация.** Испанский язык не происходит от греческого, но историческая и культурная связь между этими народами и языками неоспорима. Оба языка уникальны, в них есть общие звуки, которые довольно редко встречаются в других языках, что подчеркивает их сходство. У испанского и греческого языка схожая фонетика, слова имеют одинаковую форму, как в устной речи, так и в письменной. Цель работы – определить, как присутствие греков на Пиренейском полуострове повлияло на испанский язык.

**Abstract.** The Spanish language is not based on Greek, but the historical and cultural connection between the folks and languages is obvious. Both languages are unique they have common sounds that are quite rare which marks their similarity. Spanish and Greek have the same phonetics, both languages sound as they are written. The aim of the research is to determine how the presence of the Greeks in the Iberian Peninsula affected the Spanish language.

**Ключевые слова:** испанский язык, греческий язык, культура, заимствованные слова, состав языка.

**Key words:** Spanish, Greek, culture, borrowed words, language composition.

El castellano es la lengua romance más hablado en el mundo actual. Se habla en casi toda la Península Ibérica, en el sudoeste de Estados Unidos, en todo México, en toda América Central y América del Sur (a excepción de Brasil y Guayanas) y es la lengua de un grupo minoritario de hablantes de Filipinas. La amplitud geográfica ha contribuido a la aparición de diferentes dialectos. La formación del español fue promovida por el latín, el árabe, incluso griego, que constituye 10%.

Los primeros vestigios de la presencia griega en España datan aproximadamente de la primera mitad y mediados del siglo VIII A. C. Sobre España, los griegos no tenían ni idea durante mucho tiempo. Si los micénicos sabían algo sobre este país, entonces este conocimiento persistió en forma de indicaciones oscuras de la mitología unas tierras occidentales lejanas, donde se pone el sol, se encuentra el Jardín mágico de las hespérides, donde viven las Gorgonas [1].

Los griegos de Focea, la ciudad jónica más septentrional, establecieron contactos con España. Su territorio era limitado y escaso, pero era muy natural que la pesca fuera muy extendida por la proximidad del mar. Los foceos se dedicaron más al comercio marítimo, sin descuidar la piratería. Heródoto relata el primer viaje de los foceos a España: los foceos descubrieron Adriá, Tirrenia, Iberia y Tarteso. En Tarteso fueron recibidos amistosamente por el rey Argantonio, quien los invitó a establecerse en su país. Según Heródoto, pudieron regresar a su patria y traer más de 1,5 toneladas de plata, según el cronista, "obteniendo un beneficio como ningún griego lo hacía entonces" [2].

Los griegos se introdujeron activamente en el mundo del sur y sureste de España, establecieron contactos directos con Tarteso, se establecieron en el territorio de tartessos y cerca de estos territorios. Sin embargo, el carácter de las relaciones greco-españolas era predominantemente comercial. Al establecer contacto con la población local, los griegos influyeron en sus vidas. La cultura ibérica muestra una cierta influencia helénica:

- las primeras monedas en España (de Emporion y Rodas) son de tipo fociano;
- los griegos influyeron en el urbanismo;
- los griegos fomentaron la agricultura y promovieron el cultivo de la vid y el olivo. Los griegos también aportaron el torno alfarero, para la elaboración de piezas cerámicas;
- los griegos hicieron una gran contribución a las artes y la educación, aparecieron teatros, escuelas y academias como la Asklepias de Andalucía

Por supuesto, la llegada de los griegos a la Península Ibérica también se reflejó en la lengua, de la que todavía encontramos confirmación en el español moderno. Vamos a ver unos ejemplos:

– «Y» se convirtió en la «i» española: *crystallus* – cristal, *cristalizar*, *etymologia* – etimología, *gyrare* – girar;

– «PH», «CH», «RH», «TH» se convirtieron en «f», «c», «r», «t»: *phantasia* – fantasía, *phrasis* – frase, *chorus* – coro, *monarcha* – monarca, *rhythmus* – ritmo, *rhetorica* – retórica, *athlete* – atleta, *bibliotheca* – biblioteca;

– «MPH» se convirtió en «nf»: *symphonia* – sinfonía, *emphasis* – énfasis [3];

Mas ejemplos nos da el Diccionario de la Real Academia, y *The Spanish Vocabulary: An Etymological Approach*, que nos permite identificar las siguientes categorías de préstamos griegos:

#### I. Terminaciones griegas de palabras:

- logía / -lógico / -logo / -logista: *biología* biológico biólogo, *apologista*;
- grafía / -gráfico / -grafo: *biografía*, biográfico, biógrafo, *caligrafía*;
- sis / -tis (términos médicos, todos femeninos): *caligrafía*, crisis, *gastritis*, *bronquitis*;
- ema / -oma: lema, tema, problema, hematoma;
- tico / -tica: diplomático, acústico, atlético.

#### II. Prefijos:

- bio- (gr. *bios* = vida): *biografía*, *biología*, *biomecánica*;
- foto- (gr. *fōs*, *fōtos* = luz): *fotocopia*, *fotogénico*, *fotografía*.

#### III. Sufijos:

- grafía (gr. *grafē* = escritura, inscripción): *autobiografía*, *bolígrafo*;
- zoico (gr. *zōon* = animal, ser viviente): *antropozoico*, *mesozoico*, *neozoico*, *paleozoico* [5].

También consideremos las palabras que «esconden» su origen Griego:

- almendra (lat. vulg. *amyndula* < gr. *amugdalē*);
- bailar (lat. *bellare* < gr. *pallō* = saltar, menear);
- bolsa (lat. *bursa* < gr. *bursa* = cuero, odre) [4].

Los resultados del estudio y las categorías destacadas demuestran que los griegos tuvieron un impacto significativo en la vida de los habitantes de la Península Ibérica. Los griegos contribuyeron tanto a la vida cotidiana en España como a la lengua española. El griego tiene la mayoría de las consonantes que pueden considerarse como características del español. Las palabras de origen griego se refieren principalmente a los campos de la ciencia, la tecnología y la medicina.

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# ОБЩЕСТВЕННЫЕ НАУКИ

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СИСТЕМАТИЗАЦИЯ КОМПЕНСАЦИОННЫХ ВЫПЛАТ SYSTEMATIZATION OF COMPENSATION PAYMENTS

Аннотация. В статье рассматриваются понятие «компенсации» и способы социальной поддержки в виде двух групп компенсационных выплат, а также их разделение в зависимости от влияющих факторов. Целью исследования является анализ правового регулирования компенсационных выплат как из бюджетов различных уровней, так и из фондов заработной платы предприятий, для выявления проблем и внесения предложений по совершенствованию законодательства. Методологической основой являются методы: системный анализ, анализ и синтез, классификация и обобщение. На основании изученного теоретического материала можно сделать вывод, что компенсационные выплаты не относятся к постоянной части заработной платы и не связаны с оплатой за фактически отработанное время или фактически выполненную работу. Компенсационные выплаты в настоящее время являются самостоятельным видом выплат по системе социального обеспечения наряду с пособиями компенсационного характера, которые заключается в денежных выплатах (разовых и периодических), имеющих четко выраженный характер возмещения в случаях, предусмотренных действующим законодательством, а так же существуют выплаты компенсационного характера по ТК РФ полагающиеся всем работникам которые трудятся во «вредных» условиях – их характер может отличаться в зависимости от региона.

Abstract. The article discusses the concept of “compensation” and methods of social support in the form of two groups of compensation payments, as well as their division depending on the influencing factors. The purpose of the study is to analyze the legal regulation of compensation payments both from budgets of various levels and from the payroll funds of enterprises, in order to identify problems and make proposals for improving legislation. The methodological basis includes the following methods: system analysis, analysis and synthesis, classification and generalization. Based on the theoretical material studied, it can be concluded that compensation payments do not relate to the permanent part of wages and are not related to payment for the time actually worked or the work actually performed. Compensation payments are currently an independent type of payments under the social security system along with compensatory benefits, which consist of monetary payments (one-time and periodic) that have a clearly defined nature of compensation in cases provided for by current legislation, as well as there are compensatory payments under

the Labor Code of the Russian Federation that rely on all employees who work in “harmful” conditions – their nature may vary depending on the region.

Ключевые слова: социальная поддержка, компенсационная выплата, помощь гражданам, социальные выплаты, компенсации по трудовому законодательству.

Key words: social support, compensation payment, assistance to citizens, social payments, compensation under labor legislation.

The term “compensation”, literally translated from Latin as “compensation”, is widely used both in regulations and in legal practice. Compensation payments are ways of social support for citizens performing a socially useful function who are in a difficult situation [3, p. 416]. Article 129 of the Labor Code of the Russian Federation states that compensation payments are additional payments and allowances of a compensatory nature, including payments for work in conditions deviating from normal, work in special climatic conditions and in territories exposed to radioactive contamination, as well as other compensatory payments. However, there is no single legislative definition of this term, and in practice, the word “compensation” is most often understood as monetary or other material compensation to citizens (organizations) for expenses incurred, damage caused or harm due to the occurrence of any circumstances. Thus, using the term “compensation” it is important to remember that it is used in various branches of law, and in each it can be endowed with a certain semantic content.

Funds for the assistance to citizens of the Russian Federation are allocated both from budgets of various levels and from the payroll funds of enterprises. It depends on the type of compensation stipulated by legislative acts. Conventionally they are divided into two large groups:

- compensation within the framework of labor legislation;
- social benefits [4, p. 173].

Let us consider the classification of compensation payments provided for in the Russian Federation. The concept and classification of compensation payments are not provided for by any specific regulatory act. Since the topic of the article is very extensive, for ease of perception, before listing compensation payments, we attempt to figure out how they can be classified. So, they can be divided depending on the following factors:

1. Terms on which compensation payments are paid. In particular, there may be one-time and permanent payments (they are also called lump-sum and periodic), monthly, quarterly, annual, and so on.

2. The source of funds from which compensation is paid. They can be provided by the budget, paid from the funds of the management of the organization in which an employee is employed, be paid by the causer of harm in civil law relations.

3. The purpose for which the payment is allocated. This may be compensation for damage caused (of any nature), expenses incurred by a person.

4. Categories of citizens receiving compensation. There are quite a lot of categories including disabled people, pensioners, military personnel, mothers, participants in the remedial work after accidents and catastrophes, participants in military conflicts, disabled citizens, etc.

Below there is detailed a list of compensations in order to understand in which areas such payments are made [7, p. 33]. It should be noted that there are a lot of them, and they are enshrined in a huge number of regulations at various levels –from Federal laws to Government resolutions.

Social benefits include:

Compensation for victims of the Chernobyl accident:

1. For those persons who received the radiation dose that led to radiation sickness at the Chernobyl Nuclear power plant, as well as liquidators of the consequences of the accident, compensation payments are provided for the purchase of food products, due to the requirements of Articles 14, 15 of Federal Law No. 1244-1 [2].

2. For citizens who live or work in the exclusion zone, compensation payments are provided for the nutrition of children under the age of 3 and in kindergartens, by virtue of Article 19 of Federal Law No. 1244-1 [2].

Compensation for the disabled:

1. It is provided for the reimbursement of half of the expenses from the rent for an apartment and communal services for persons with disabilities. Similar payments are provided for citizens who raise disabled children (Article 17 of the Federal Law No. 181 of 24.11.1995) [3].

2. For those parents whose children have limited prospects, and they obtain education at home, by virtue of Article 19 of Federal Law No. 181.

3. Monthly payments for adults with disabilities and children. Payments depending on which disability group is established. The basis is Article 28.1 of Federal Law No. 181.

Compensation for the military, employees of the Ministry of Internal Affairs and the Ministry of Emergency Situations:

1. Compensation is provided for the wives of employees of the Ministry of Emergency Situations and the Ministry of Internal Affairs who live in areas where employment is difficult, on the basis of paragraph 1 of Decree of the President of the Russian Federation No. 1110.

2. When military personnel use the transport belonging to them for official purposes, on the basis of Article 20 of the Federal Law of 27.05.1998 No. 76.

3. If damage or harm to health has been caused to military personnel, on the basis of Article 18 of Federal Law No. 76.

4. If it is impossible to organize meals for the military in the Far North, then compensation is paid, based on Article 14 of Federal Law No. 76.

Compensation for mothers and other persons raising children:

For mothers and other relatives who are in labor relations and raise children up to 3 years old, on the basis of the Decree of the President of the Russian Federation dated 30.05.1994 No. 1110.

Regarding compensation within the framework of labor legislation, it can be pointed out that Article 164 of the Labor Code of the Russian Federation defines the term compensation from the point of view of labor law. This is compensation to an employee of the organization for his expenses related to the performance of his duties in the field of labor [8]. The list of expenses is not disclosed, but it is clear from the content of the norm that they can be any.

Employees of organizations may incur various expenses, for example, travel expenses, which are made by an employee to travel to their destination and to hire a living space [8]. They must be reimbursed. This can also include any employee expenses that were incurred on behalf of the organization's management.

Classification of workers' compensation based on the Labor Code of the Russian Federation:

1. The already mentioned reimbursement of expenses related to a business trip, by virtue of Article 168 of the Labor Code of the Russian Federation.

2. If an employee is involved in the performance of state duties while working, for example, as a juror, compensation is paid due to the requirements of Article 170 of the Labor Code of the Russian Federation.

3. When reducing staff, on the basis of Article 178 of the Labor Code of the Russian Federation [8].

4. When receiving an occupational injury or occupational disease, on the basis of Article 184 of the Labor Code of the Russian Federation.

5. When carrying out work in conditions harmful to health, on the basis of Article 222 of the Labor Code of the Russian Federation.

6. When traveling on vacation, or moving to work in the conditions of the Far North, on the basis of Articles 325 and 326 of the Labor Code of the Russian Federation.

As a result of the conducted research, the following results were obtained. The emergence of a new type of social security, namely compensation, in the Russian legislation is caused by the need to overcome a number of negative consequences of the transition to market relations, primarily associated with a sharp decline in the standard of living of unemployed citizens, the adoption by the

state of additional measures aimed at their social protection. Compensation payments are quite difficult to distinguish from benefits. Both benefits and compensations are cash payments. However, if benefits are established by federal law, as required by the Constitution of the Russian Federation, then compensation is introduced by both laws and by-laws: decrees of the President of the Russian Federation, resolutions of the Government of the Russian Federation. The institution of compensation exists in labor law (compensation for travel expenses to the place of business trip, compensation for unused vacation, etc.), in civil law (compensation for moral damage, compensation for deposits, etc.). But compensation payments in social security law differ from compensations provided for by other branches of legislation in that the condition for their appointment and payment is the onset of social risks (birth and upbringing of children, care for a disabled person, etc.).

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**ЗНАЧЕНИЕ БАНКОВСКОГО КРЕДИТОВАНИЯ
В РАЗВИТИИ РЕАЛЬНОГО СЕКТОРА ЭКОНОМИКИ
THE BANK LENDING IMPORTANCE FOR THE DEVELOPMENT OF
THE REAL SECTOR OF THE ECONOMY**

Аннотация. В данной статье авторы предпринимают попытку установить характер взаимодействия банковского и реального сектора экономики в Российской Федерации. В современных условиях экономическое развитие требует значительных инвестиционных потоков, поэтому увеличение роли банков в финансировании предприятий становится чрезвычайно важным фактором роста ВВП в России. Авторами проводится анализ основных показателей банковского кредитования с целью формулирования действенных рекомендаций по улучшению текущей ситуации. Отмечается, что упрощение условий заключения банковских договоров краткосрочного и долгосрочного кредитования, предоставление льготных условий для различных форм предприятий, а также дальнейшее снижение ключевой ставки являются основными методами стимулирования объема кредитов в стране. Отмечается роль государственного влияния в вопросе развития взаимодействия банковского и реального секторов экономики на каждой стадии экономического цикла.

Abstract. In this article, the authors attempt to establish the character of interaction between the banking and real sectors of the economy in the Russian Federation. In modern conditions, economic development requires significant investment flows, therefore, an increasing role of banks in financing enterprises is becoming an extremely important factor in GDP growth in Russia. The authors analyze the main indicators of bank lending in order to formulate effective recommendations to improve the current situation. It is noted that the simplification of the conditions for making short- and long-term bank lending agreements, the granting of preferential conditions for various forms of enterprises, as well as further reduction of the key interest rate are the main methods of stimulating the volume of loans in the country. The role of state influence in the development of interaction

between the banking and real sectors of the economy at each stage of the economic cycle is highlighted.

Ключевые слова: реальный сектор экономики, банковское кредитование, малый и средний бизнес, источники финансирования, экономическое развитие.

Key words: real sector of economics, bank lending, small and medium-sized businesses, sources of funding, economic development.

The real sector of the economy is a set of industries that produce tangible and intangible goods and services. In the context of economic development, which requires significant amounts of investment, the problem of studying the role of commercial banks in financing the real sector is becoming more and more urgent. The growing share of bank lending in the financing sources of enterprises would be an engine for increasing production, and, as a result, business activity in the country. Therefore, identifying effective practical methods of attracting commercial banks to investment activities is one of the important tasks in the modern Russian economy.

Nowadays the Russian Federation has seen a reduction in credit resources both in real terms and in relation to GDP. According to the World Bank, the volume of lending to the Russian economy by the beginning of 2016 amounted to 57.8% of GDP, and by the beginning of 2019 – it decreased to 53.8% of GDP [3]. At the same time the volume of lending in the world increased from 132.8% of GDP to 142.5% of GDP during the period under review. The reason for this situation in Russia is primarily the negative dynamics of the ruble exchange rate.

The role of the banking sector in lending to enterprises in Russia has traditionally remained at a low level, which is proved by the dynamics of investments in fixed assets by sources of financing (Table 1) [5].

Table 1. Investments in fixed assets by sources of financing

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total investments in fixed assets	100	100	100	100	100	100	100	100	100	100
Internal funds	41.9	44.5	45.2	45.7	50.2	51.0	51.3	53.0	55.0	55.2
External funds	58.1	55.5	54.8	54.3	49.8	49.0	48.7	47.0	45.0	44.8
of them:										
bank loans	8.6	8.4	10.0	10.6	8.1	10.4	11.2	11.2	9.8	10.0
borrowed funds of other organizations	5.8	6.1	6.2	6.4	6.7	6.0	5.4	4.3	4.8	4.8
investments from abroad			0.8	0.9	1.1	0.8	0.8	0.6	0.4	0.3
budget funds	19.2	17.9	19.0	17.0	18.3	16.4	16.3	15.3	16.2	19.1
funds of state extra-budgetary funds	0.2	0.4	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2
funds of organizations and the population for shared-equity construction	2.0	2.7	2.9	3.5	3.2	3.0	3.3	3.5	4.3	3.3
Others	22.3	20.0	15.6	15.7	12.1	12.2	11.5	11.9	9.3	7.1

Table 1 shows that the role of bank lending in the sources of investments in fixed assets during 2011-2020 remained consistently low (averaged 9.83% of all investments in fixed assets). At the same time, in the developed countries of the world, the share of bank lending is 40–50%. Therefore, we can say that due to low involvement of banks in lending to enterprises, there is an acute shortage of investments in fixed assets in Russia. This negative trend is also reflected in the share of fixed

capital investments in GDP, which for many years has not exceeded the level of 25% necessary to ensure the economic security of the country (Table 2) [4].

Table 2. Share of fixed capital investments in GDP, %

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Share of fixed capital investments in GDP, %	20.7	21.0	21.4	20.8	20.0	21.3	21.4	20.0	20.6	21.8

We can see that insufficient lending to the real sector of the economy leads to a strong physical deterioration of fixed capital, and, thus, to a slowdown in economic growth.

The main reason for inadequate lending in the Russian economy is traditionally considered to be the high interest rates of commercial banks, which makes bank loans the least profitable source of financing.

One of the reasons for this interest rate is the high refinancing rate of the Central Bank. For example, here are the key interest rates in other countries of the world (Table 3) [3].

Table 3. Key interest rates in developed countries in 2021

	Russia	USA	Great Britain	Japan	Canada	Australia
Key interest rate, %	6.75	0.25	0.1	-0.1	0.25	0.1

As we can see, today Russia has the key rate which is several times as high as the interest rates in the developed countries, which negatively affects the popularity of loans in Russia as sources of financing. Therefore, it is desirable to reduce the interest rate in the country, but at the same time it is necessary to take into account the level of inflation, below the limit of which it is impossible to set the refinancing rate. In Russia inflation reacts sharply to economic shocks, so the Central Bank, responsible for maintaining a low level of inflation in the country, does not seek to reduce interest rates.

On the other hand, the enterprises of the real sector of the economy are mostly unreliable borrowers. This forces the banks that issue them a loan to form large amounts of reserves in case of losses, which, accordingly, go out of the bank's turnover for several years. This fact also leads to an increase in the cost of credit.

Due to the unavailability of credit, enterprises are forced to rely more on their own funds (during the last decade, the share of own funds averaged 49.3%). However, many enterprises, namely small and medium-sized businesses, cannot afford self-financing, which leads either to a reduction in production or to withdrawal from the market. Therefore, the share of small and medium-sized businesses in the GDP of the Russian Federation is low (Table 4) [5].

Table 4. The share of small and medium-sized enterprises (SMEs) in the gross domestic product of the Russian Federation (in current prices)

Year	2017	2018	2019
Share of SMEs in GDP, %	22.0	20.4	20.8

At the same time, in developed countries, as a result of the availability of bank loans, the profit from the activities of small and medium-sized businesses ranges from 50% to 80% of GDP [2].

The unavailability of loans for enterprises in the real sector of the economy was also reflected in the reduction in the purchasing managers' index (PMI) business activity index from 48.9% in 2019 to 46.9% in October 2020. We may note that to ensure economic growth, the value of this index should be above 50%.

Considering all of the above, it is worth noting the positive trend observed in the Russian economy. The average monthly volume of lending to small and medium-sized businesses in 2021 increased significantly compared to 2019 and 2020 (Figure 1) [1].

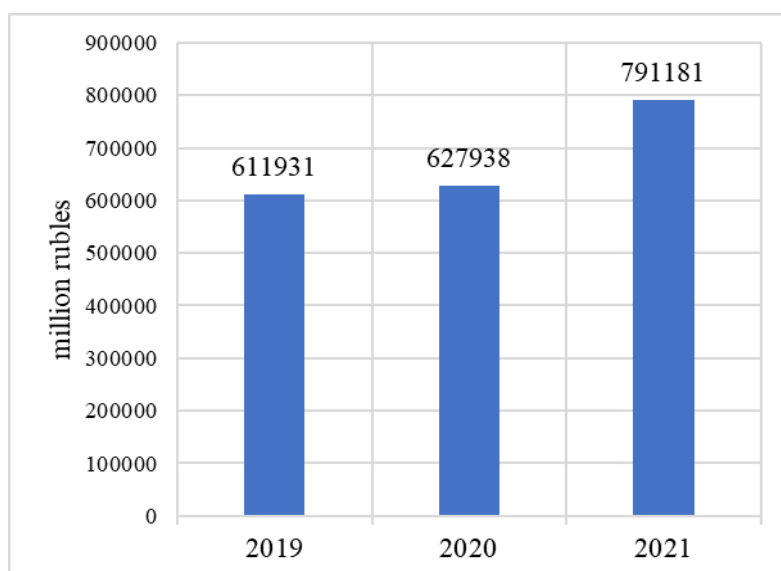


Figure 1. Average monthly volume of loans granted to SMEs

The positive trend results from government programs to support small and medium-sized businesses. By the Government Decree of the Russian Federation dated December 31, 2020, the rate on preferential loans for small and medium-sized businesses and the self-employed was reduced to 7.25% per annum.

Thus, we can conclude that the problem of activating bank lending to the real sector of the economy is extremely important and acute at the present stage of development. Despite the positive shifts in the dynamics of lending and the measures taken by the state, the availability of loans for the real sector does not correspond to the existing demand. The State needs to continue to develop more effective measures to improve the financing of enterprises. For example, one of them is a further reduction in interest rates, which would bring the key rate in Russia closer to global standards to reach the level of developed countries, where bank loans account for 50–80% of GDP. Another way to solve the problems of bank lending may be to work out a comprehensive mechanism that includes regulatory and incentive measures to accumulate long-term resources, increase the scale and quality of capital in the banking sector, and reduce investment and credit risks of investments in the real sector of the economy.

The measures taken would allow bank lending in Russia to reach a qualitatively new level, namely:

- to strengthen the interaction between the banking and real sectors of the economy;
- to improve the financing and renewal of fixed capital of enterprises in the real sector of the economy;
- to activate the investment activity of enterprises in the real sector of the economy;
- to ensure the development of a long-term bank loan.

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**СПЕЦИФИКА «ДИПЛОМАТИИ ДАННЫХ» НА ПРИМЕРЕ
КИТАЙСКОЙ НАРОДНОЙ РЕСПУБЛИКИ
THE SPECIFICS OF "DATA DIPLOMACY":
THE CASE OF THE PEOPLE'S REPUBLIC OF CHINA**

Аннотация. В статье анализируется роль использования «больших данных» в современных внешнеполитических процессах. Отмечается, что развитие технологий «больших данных» существенно трансформирует внешнеполитическую деятельность международных акторов политики. Рассматриваются особенности реализации феноменов «цифровой дипломатии» и «дипломатии данных» в Китайской Народной Республике (КНР).

Abstract. The article analyzes the role of the use of “big data” in the modern foreign policy processes. It is noted that the development of “big data” technologies essentially transforms the foreign policy activities of international political actors. The features of the implementation of the phenomena of “digital diplomacy” and “data diplomacy” in the People's Republic of China (PRC) are considered.

Ключевые слова: «большие данные», цифровизация, «цифровая дипломатия», «дипломатия данных», Китайская Народная Республика, Интернет.

Key words: big data, digitalization, digital diplomacy, data diplomacy, People's Republic of China, Internet.

The active development of the technological foundation of digitalization contributes to the essential transformation of all functional processes of society. The digital revolution, the growth in the number of Internet users, the spread of new media set trends in the development of both domestic and foreign policy of the modern state, actualize the use of non-forceful methods of influence in the international arena. All this determines the emergence of non-traditional, alternative to classical diplomacy methods and technologies, causing the emergence of “digital diplomacy” and “data diplomacy”, implying the widespread use of information and communication technologies for the implementation of diplomatic tasks.

The restructuring of the geopolitical space, the formation of new centers of power and the struggle for leadership in international relations are pushing states to actively use modern toolship. Currently, the issue of using “big data” technologies, which allow collecting and analyzing arrays of digital information in order to rank the audience for predicting the results of certain decisions, i.e. obtaining valuable information through the use of “big data analytics”, is being updated. It should be noted that “big data” technologies are actively used both in domestic and foreign policy processes, which expands the possibilities of not only image-designing processes, but also makes it possible to use manipulation potentials.

China is becoming a significant “player” in international relations. Acting as a powerful actor of the world economy, China has set its sights on the leadership in the world politics. Because of this, the Chinese state uses various methods, including diplomatic ones. The diplomacy of modern China, being global in all scales, is a complex combination of a variety of traditional and new methods and mechanisms.

Beijing's digital diplomacy, which is a key instrument of the state's soft power, has a special specificity and is primarily aimed at maintaining internal stability and ensuring security, while outside the PRC it is aimed at forming a positive public opinion on acute political issues. As part of this, it should be pointed out that China has a ban on anonymity in the Internet space [1, p. 79]. In addition, the use of worldwide social networks and other Internet resources such as Twitter, Facebook, Instagram, YouTube, and WhatsApp are also officially banned in China. Despite the attempts to circumvent the current ban with the help of specialized Internet software, the majority of Chinese Internet users prefer controlled Chinese analogues such as WeChat (a social network with up to 1.17 billion active users monthly), Sina Weibo (the Chinese analogue of Facebook), messenger QQ and others [2, p. 383]. At the same time, it should be noted that the official representative offices of China in various countries use all available channels of information dissemination, including Internet resources prohibited on the territory of the People's Republic of China [2, p. 383].

The priorities of the PRC in the implementation of “digital diplomacy” are: the creation of a unique national brand of the state and its leadership (it should be clarified that the development of a virtual image of Xi Jinping is a separate area of China's digital diplomatic activity), debunking the myth of the “Chinese threat”, promotion and popularization of the Chinese language, culture and political agenda [2, p. 384].

Meanwhile, Chinese “digital diplomacy” is characterized by the widespread use of censorship technologies and the use of “cyber soldiers” [4; 5]. The most active social network of China in matters of “digital diplomacy” is Sina Weibo, which widely uses censorship technologies: not only deleting posts is used, but also disabling the ability to share or comment [4]. In addition, about 300 thousand “cyber soldiers” are engaged in posting relevant information on blogs, websites and forums and actively oppose negative information about China on foreign Internet platforms [5]. It is worth noting that a significant achievement of the Chinese digital policy was the reorientation of Huaqiao (50 million Chinese migrants), who perceive the PRC as their homeland today, and not the Republic of China (Taipei) [1, p. 79].

In the context of the concept of “datafication”, data diplomacy, which involves analyzing the alignment of political forces in social networks, using methods of massive propaganda dissemination and blocking “undesirable content”, is becoming a new stage in the development of digital diplomacy. For the first time, the term “big data diplomacy” was proposed by Professor of the University of Rochester T. Duy in 2015 and it was presented as a developing phenomenon “linking the concepts of

data processing and analysis, technology and the science of computing with sociology, international relations and diplomatic negotiations” [3, p. 30]. Today, a more specialized concept of “data diplomacy” is used, which is a form of public diplomacy aimed at using artificial intelligence (AI) and “big data” analytics in order to increase the effectiveness of foreign policy propaganda, combat the information dominance of opposing actors and implement other foreign policy tasks [2, p. 383]. China is one of the leaders in the introduction of “data diplomacy” technologies. The People’s Republic of China (PRC) uses the entire layer of available tools for digital influence on the audience [2, p. 383].

Thus, it is necessary to conclude that the phenomena of “digital diplomacy” and “data diplomacy” are being implemented very successfully in the People’s Republic of China, providing opportunities for China to spread additional influence in the international arena. It should be noted that involvement in the development of digital technologies within the framework of the implementation of diplomatic activities allows to form a certain image of the state on the world stage, thereby strengthening both foreign and domestic political positions. The introduction of “big data” into international political processes makes it possible to predict the behavior of the audience and exert the necessary influence on it in order to achieve the desired result.

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**СОВРЕМЕННЫЕ УНИВЕРСИТЕТСКИЕ КАМПУСЫ И
ИСПОЛЬЗОВАНИЕ ЗЕЛЕННЫХ ИННОВАЦИЙ
MODERN UNIVERSITY CAMPUSES AND
USING ENVIRONMENTAL INNOVATIONS**

Аннотация. В тезисах отмечены перспективы устойчивого роста инновационной экологической активности, направленной на благоустройство территории кампуса Севастопольского государственного университета. Автор исследует вопрос, связанный с внедрением и использованием высоких градостроительных технологий, сопоставляет их культурные, социальные, коммуникационные, а также эко-технологические модели. В статье представлены основополагающие факторы для быстрого развития экологических инноваций в России, в ходе исследования которых раскрывается проблематика их реализации, несмотря на ряд их очевидных преимуществ (запрос по созданию высокого качества жизни, необходимость индустриализации городов и внедрение инноваций, а также потребность в создании высокооплачиваемых рабочих мест).

Abstract. The theses highlight the perspectives for sustainable growth of the innovative environmental activity directed on the improvement of the campus territory of Sevastopol State University. The author examines the issue related to the introduction and use of high urban planning technologies, compares their cultural, social, communication, as well as eco-technological models. The article presents the fundamental factors for the rapid development of environmental innovations in Russia. Studying the problems of their implementation is described, despite a number of their obvious advantages (the request to create a high-quality life, the need to industrialize cities and the introduction of innovations, as well as the need to create highly paid workplaces).

Ключевые слова: университетские кампусы, инновационная активность, экологические инновации, устойчивый рост, территория.

Key words: university campuses, innovative activity, environmental innovations, sustainable growth, territory.

The campus is a modern space of the university campus, which includes a complex multifunctional environment [3; 8]. The territory of the Sevastopol State University campus is one of the special features in the organization of the architectural style of the university. The green complex space is an important element of combining the composition and giving an aesthetic image to the Sevastopol State University. When creating a project for the improvement of the university campus spaces, it is important to take into account that this place will be open not only to employees and to students, but to the residents of the city [1; 6]. It is necessary to create a comfortable multifunctional environment that meets all the requirements of a harmonious spatial territory.

The relevance of the topic of the development of university campuses is significant, because the presence of such campuses within a number of countries provides a vivid example of their socio-economic development. Universities become catalysts of economic growth of countries, centers of social and cultural life of regions, connecting elements between society, government and business, contribute to the greening of surrounding territories. The reasons for this are diverse: this is the desire of governments and municipal authorities to improve the quality of human capital, improve the well-being of their population, the desire to develop and introduce innovations, and it is also the need to invest in the environmental component in their territories, because strict compliance with environmental regulations is becoming a universal rule [2; 7].

Modern universities actively use recreational areas, create public spaces, integrate achievements of science and practice, apply innovative technologies of sustainable development, create the high-quality architectural and spatial environment, integration into the natural landscape, business incubators and start-up sites, museums, stadiums and concert halls, places for physical education and sports, territory security and social comfort, as well as the formation of university cultural traditions. The importance of universities in the innovative development of their region, the country as a whole, and integration groups are rapidly increasing.

The architecture models correspond to the idea of the university as a center of intellectual activity and a generator of scientific discoveries in the field of modern eco-technologies. In other words, the arrangement of university complexes should inspire scientists to new promising discoveries, and instill in students an attentive attitude to the environment. Currently, in the conditions of rapid development of science and technology and the change of technological structure, the role of universities in modern society is beyond doubt. In the new knowledge economy, increasing the competitiveness of universities is the main task of any state, since its economic and social development depends on it.

In the environmental aspect, the university campus should use resource-saving technologies; adhere to the requirements of environmental standards and sanitary and hygienic norms. Green spaces, park areas help to create ecological balance and comfort and are an integral part of many universities [4; 5]. For example, the campus of Sevastopol State University – a large university specializing in natural sciences, is an extensive park in which academic buildings are freely located, and the central place is occupied by an area. The main axis of the Sevastopol State University campus is an extended green alley along which academic buildings are located. There is a square in front of the entrance to each academic building.

University Square is an important image element of the campuses, it is also a place of social communication. Forum Square of Sevastopol State University is located on a steep terrain and is a system of platforms that is connected by a cascade of stairs. The university is surrounded by very beautiful nature and is located close to Black Sea Bay.

The university complexes as a set of educational facilities are usually divided into 3 main types: the distributed complexes are a set of university facilities dispersed in an urban environment; the local complexes are the high-density campuses in urban development; the suburban complexes are located outside of dense urban development. However, a number of existing university sites were built and put into operation in the second half of the twentieth century, and nowadays they have a high degree of wear and tear.

Universities are also seen today as expensive businesses. They are overgrown with business incubators, science parks, innovation centers. They begin to produce future technologies; large companies realize discoveries and industrialize them. The environment of the university should provoke the student to intellectual discoveries.

It should be noted that the university campuses of both the world and Russia are being transformed in accordance with innovative digital and environmental requirements. Of course, universities serve for the explosive economic growth of the world economy, on the one hand, and, on the other hand, the countries and regions where they are located. Thanks to the development of small university firms that actively cooperate with larger firms, innovations and advanced technologies are being developed and implemented.

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**РЕКОНСТРУКЦИЯ ЛИТЕЙНОГО ЦЕХА НА ТЕРРИТОРИИ
СЕВАСТОПОЛЬСКОГО МОРСКОГО ЗАВОДА
RECONSTRUCTION OF THE FOUNDRY ON THE TERRITORY OF THE MARINE
PLANT OF SEVASTOPOL**

Аннотация. В данной статье представлен проект по преобразованию Севастопольского морского завода, важность которого для судоремонтного и судостроительного кластера города и государства остается неоспоримой. Проектом предусмотрено решение задач по сохранению исторического облика завода, как значимого архитектурного объекта. В статье рассмотрены технические и социальные проблемы при возведении промышленного здания, указаны объемно-планировочные решения производственного строения и общий принцип внутрицехового зонирования, а также предложена идея реконструкции литейного цеха Севастопольского морского завода. Учитывая ключевую значимость эстетического облика площадки Севастопольского морского завода, автор предлагает рассмотреть возможные для применения строительные материалы, их фактуру и цвет для повышения выразительности архитектуры.

Abstract. This article presents a project for the transformation of Sevastopol Marine Plant, the importance of which for the ship repair and shipbuilding cluster of the city and the state remains undeniable. The project provides for solving problems of preserving the historical appearance of the plant as a significant architectural object. The article discusses the technical and social problems in the construction of an industrial building, indicates the space-planning solutions of the industrial structure and the general principle of in-shop zoning, and proposes the idea of reconstruction of the foundry of Sevastopol Marine Plant. Taking into consideration the key importance of the aesthetic appearance of the site of Sevastopol Marine Plant, the author proposes to consider building materials to be used, their texture and color to increase the expressiveness of architecture.

Ключевые слова: градообразующее предприятие, судоремонтная верфь, судостроительная верфь, исторический облик, Севастопольский морской завод.

Key words: city-forming enterprise, ship repair yard, shipbuilding yard, historical appearance, Sevastopol Marine Plant.

Sevastopol currently needs the largest city-forming enterprise. Since the plant has not been reconstructed for more than 30 years and the number of employees has sharply decreased during this time, it requires design work. The plant needs to replace out-of-service equipment with new, technological equipment that requires new capacities. Ships and tourist boats when entering the Sevastopol Bay form the first general impression of the city; they pay attention to the huge site of the Marine Plant of Sevastopol. The purpose of the article is to show the possibilities of transformation of the Marine Plant of Sevastopol for solving the technical and social problems.

The history of the Marine Plant of Sevastopol is the history of Sevastopol and the Black Sea Fleet. In April 1783, the Sevastopol (then Akhtiar) Bay, among others, was inspected by captain of the II rank Ivan Bersenev, specially sent by order of Empress Catherine II to select the location of the military port on the southwestern coast of Crimea, and recognized by him as the most suitable for this.

July 23, 1835 – construction of a five-chamber dry dock at the new site of the enterprise began. On this day, the first lock of the dock was laid.

The reconstruction site of the Sevastopol Marine Plant is located on the western shore of the Southern Bay of the city of Sevastopol, Nakhimov district, in Heroes of Sevastopol Street, 13. Geographically, the plant is located on two sites: the main one – “Yuzhnaya” and “Inkerman” with a total area of 53 hectares. The presence of two dry docks, specialized workshops for the repair of the hull, the manufacture of hull structures, ship equipment, systems and pipelines, creates conditions for the repair, docking, re-equipment, modernization of ships and vessels of various classes and purposes (Figure 1.1.).

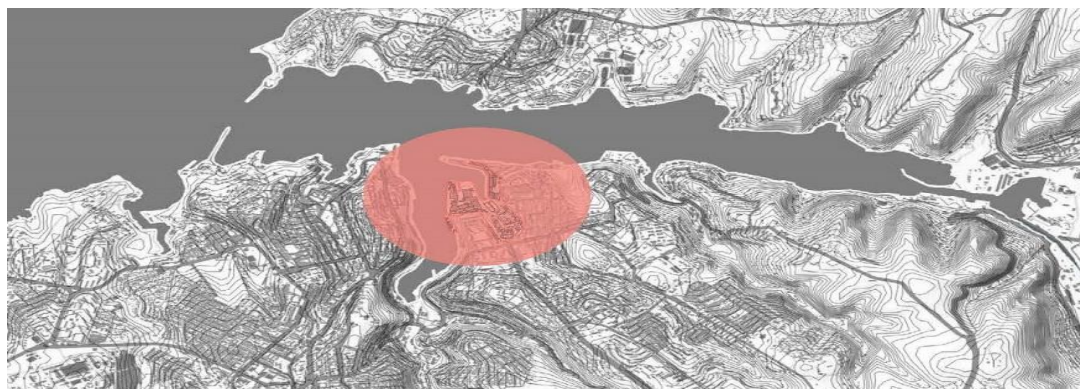


Figure 1.1. The territory of the Marine Plant of Sevastopol

For more than two centuries, the Marine Plant of Sevastopol has built over 500 and repaired more than 5,000 ships and vessels.

The specifics of the reconstructed object of the Marine Plant of Sevastopol includes two tasks:

1) preservation of the historically developed architectural appearance in which it is located. Reducing the negative impact on the environment and harmonious shaping under the given conditions;

2) organization of a certain functional process by the modern needs of society, in compliance with all functional, technological, operational requirements.

The successful solution of these tasks, ensure the integrity of the urban environment, is possible if four groups of factors are taken into account: environmental, artistic and aesthetic, social, correct technological processes that will determine the functional organization of the Marine Plant of Sevastopol (Figure 2.1., Figure 2.2.).



Figure 2.1. Perspective view on the territory of the Marine Plant of Sevastopol



Figure 2.2. Perspective view of the territory on the Marine Plant of Sevastopol

The meaning of the construction of any industrial building is the optimal solution, on the one hand, technical problems, on the other – social. The first group of problems is the placement of technological equipment, transport and other types of its maintenance, providing production with all the necessary energy and raw materials. The second group is caused by the presence of a person in the workshop and is associated with the need to create a comfortable microclimate, a system of consumer services for workers, and ensuring reliable labor protection [1]. The features of the technological process, the nature of the equipment and the parameters of the in-shop environment primarily determine the space-planning solution of an industrial building. At the same time, urban planning conditions, the position of the building in the surrounding buildings, human and cargo flows on the general plan of the enterprise play an essential role. The space-planning solutions of the workshop are based on the following principles:

- clear functional zoning of production areas with the maximum length of technological flows;
- maximum unification of building construction parameters;
- compact placement of production sites;
- providing comfortable working conditions and consumer services for workers and employees [4].

The general principle of in-shop zoning is as follows:

- public facilities and main entrances are placed on the front side of the production building;
- the main production departments are located in the central part;
- there are utility and storage rooms on the back and sides [5].

The ways of moving goods are direct-flow without return movements and mutual intersections, and the ways of movement of workers are the shortest and safest.

The building of the foundry of the Marine Plant of Sevastopol was investigated by me and the idea of its reconstruction was proposed.

The foundry building is a large-sized structure. All existing structures are dismantled, the workshop is considered a new construction. All dimensions of the workshop are changing, length and height are increasing, crane bridge equipment with a lifting capacity of 30 tons is being added. The removal of ribbon glazing, light aeration lamps, columns, beams beyond the facade plane enliven the monotony of extended facades, enrich the compositional solution and reveal the large scale of the building. The foundry in question is formed taking into account many factors, patterns and categories: general plan, relief, area, scale, proportions, tectonics, symmetry and rhythm. From the Sevastopol Bay side, it is a massive volume that supports the scale of the sea area with a high number of repair cranes, ships, ships and tourist pleasure boats.

The shape and volume of the building are largely predetermined by functional and technological factors that determine the size of the grid of columns and the number of storeys of buildings, design features, type of lighting, air exchange [5].

The modern foundry is a frame building, which does not limit the shape and size of the glazed surfaces, which serve as one of the elements of the architectural composition of the building. An important means of architectural composition is the partitioning of building facades based on the repetition of vertical and horizontal panels, vertical and horizontal ribbon glazing (Figure 3.1.) [2].



Figure 3.1. Panoramic view of the foundry

To increase the expressiveness of the architectural appearance of the industrial building, the following was used:

- the use of vertical and horizontal panels of external walls;
- search for plastics of exterior panels, with a variety of textures;
- search for proportions of window openings, making them tape, dividing large openings into several small ones;
- use of color and texture of materials;
- the use of various forms of light lanterns with integrated consideration of climate, illumination, ventilation, and other factors.

The facade from the Sevastopol Bay is a combination of white, red and black smooth surfaces, and solid glazing. Decorative facade panels are also used. The facade from the Marine Plant of Sevastopol is made using various materials: horizontal panels, glass elements, metal parts.

Solid glazing of facades is carried out using spider technology, which allows to form smooth glass surfaces without frames and bindings (Figure 3.2., Figure 3.3.) [3].



Figure 3.2. Perspective view of the foundry



Figure 3.3. Perspective view of the foundry

The main principle of the formation of the aesthetic appearance of the building through the development of facades was the creation of one in scale and perception of the image. From the water area of the Sevastopol Bay and the Marine Plant of Sevastopol, a heavy, large form supports the architectural environment.

The ice-free water area, developed infrastructure, spacious dry docks and modern technological capabilities of the plant will allow repairing ships and commercial vessels all year round. Having restored the network of educational institutions, the issue with the personnel of ship repairers will be resolved. In the near future, the Marine Plant of Sevastopol should become the leading center of ship repair in the south of Russia.

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СПАСЕНИЕ АРАЛА: РЕАЛЬНОСТЬ ИЛИ МИФ? SAVING THE ARAL SEA: REALITY OR MYTH?

Аннотация. В статье рассматриваются особенности современного экологического состояния Аральского моря. Проанализирована деятельность различных государств в рамках соглашений Международного Фонда спасения Арала.

Abstract. The article examines the features of the current ecological state of the Aral Sea. The activity of various nations within the framework of the agreements of the International Fund for Saving the Aral Sea is analyzed.

Ключевые слова: спасение Арала, международное сотрудничество, экология, туризм, водные ресурсы, социально-экономическое направление.

Key words: saving the Aral Sea, international cooperation, ecology, tourism, water resources, socio-economic issues.

The Aral Sea was one of the most important natural and economical resources and touristic destinations in Kazakhstan. It is situated on the west-southern territory of Kazakhstan, right on the border of our country with Uzbekistan (Aktobe region, Kyzylorda region, Karakalpakstan). Until 1960, the Aral Sea took the second position among all the world's closed continental lakes after the Caspian Sea and in the fourth place after Lake Victoria, Lake Superior and the Caspian Sea. There were 2 main rivers that used to fall into Aral: Syr Darya and Amu Darya. However, in 1960 these two rivers were used by local agriculture organizations for irrigation which resulted in the shrinkage of the sea. In 1989, it turned to two small lakes, connected with the Berg strait (the Northern (Big) Aral Sea and the Southern (small) Aral Sea) [1]. In 2014, the eastern part of the Southern (Big) Aral Sea completely dried up. Its water volume accounted for 7297 km³, which was the lowest volume of all, and people started associating the lake with a desert (Figure 1).

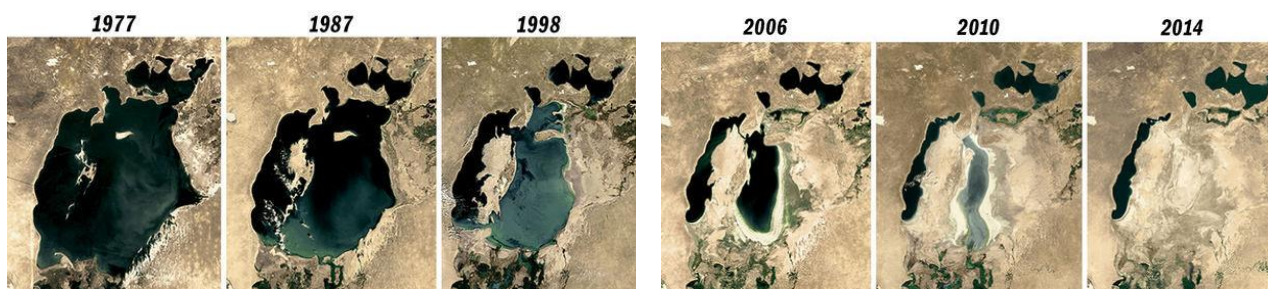


Figure 1. Changing of the area of the Aral Sea

At the moment, several organizations, such as QazaqGeography, make expeditions to study the Sea. According to the latest expedition (August 9, 2019), the lake's condition has been improved, but the problem still hasn't been solved.

The consequences of the shrinkage of the Aral Sea:

1. The drying up of the sea somewhat influenced the climate of the region. The summer became drier and hotter, the winter colder and longer. Also, large quantities of dust containing sea salts, pesticides and other chemicals are carried from the drained part of the former sea to nearby regions by winds.

2. As result of drying up, the salinity of the Big Aral increased sharply (almost 10 times), which caused the extinction of many species of flora and fauna, which were adapted to lower salinity. The Big Aral had lost fishery importance; sea posts are closed.

3. There are a number of negative effects for the inhabitants of the Aral Sea region: high unemployment, high child and maternal death rate due to unfavorable environmental conditions [3].

The main activities of the EB IFAS in the Republic of Kazakhstan include international cooperation and attraction of investments, ecology and tourism, water resources and water use, as well as socio-economic issues.

Description

1. International cooperation and investment raising

A portfolio of projects for the Kazakhstani part of the Aral Sea was created, which included over 35 proposals for financing by international organizations and financial institutions, donor countries, as well as public-private structures. Thanks to these efforts, constructive cooperation with many international institutions has already been established and being developed. The remarkable examples are GIZ, UNECE, UNDP, UNESCO Cluster Office, UNEP, USAID, IUAC, OSCE Nur-Sultan Office, CASIB, CAREC, etc. [4].

As of 2020, almost all projects were supported by donors, international and local organizations (Table 1).

Table 1. Memorandums on cooperation, agreements and contracts

№	Title	Date and place	Tasks
1	Memorandum between the Akimat of the Kyzylorda region and the EB IFAS in the Republic of Kazakhstan	31 January, 2018 Aral city	Provision of machinery for ecological and socio-economic objects
2	Memorandum of Cooperation between the World Center for Sustainable Development “RIO+” and EB IFAS in the republic of Kazakhstan	23 March, 2018 Brazil	Development of a continental partnership on the global process of climate change, water resources management and ecology
3	Memorandum of Understanding between UNECE and ED IFAS in the Republic of Kazakhstan	26 March, 2018 Geneva–Almaty	Supporting Subregional Cooperation on Dam Safety in Central Asia
4	Memorandum of Cooperation between the International Center for Water Assessment (IWAC) and EB IFAS in the Republic of Kazakhstan	April, 2018 Astana–Almaty	Development of a subregionsl partnership on international water partnership, topical water issues
5	Memorandum of Cooperation between the EB IFAS in the Republic of Kazakhstan and Qazaq Geography	May 2018 Aral Sea	Development of cooperation in scientific research and ecological tourism
6	Memorandum of Understanding between the State Natural reserve Barsakelmes and EB IFAS in the Republic of Kazakhstan	23 September 2018 Aral city	Providing assistance in solving ASBP tasks and implementing the Project Portfolio of EB IFAS

7	The contract between the German Society for International Cooperation and the EB IFAS for the implementation of the investment project “Preservation of fish in the Northern Aral Sea”	2 December, Berlin–Almaty	Design and construction of a fish protection device to prevent the loss and death of fish during spillways from the Kokaral dam
8	Memorandum between the EB IFAS and the Association of Legal Entities “Association of Environmental Organizations of Kazakhstan”	27 June, 2019 Nur–Sultan	Joint work to resolve environmental issues of the Aral Sea region
9	Memorandum of cooperation between the ID IFAS in the Republic of Kazakhstan and "Aralsoda" LLP	May, 2020 Almaty	Joint research work to improve the environmental situation in the Aral Sea region
10	Memorandum between the International Project "Central Asia Sustainable Innovation Bureau" (CASIB) and ID IFAS in the Republic of Kazakhstan	9 September, 2020 Almaty	Three-year research work on the adaptation of highly profitable and less moisture-consuming agricultural crops in the Aral Sea region at the Eco-Aral Scientific and Tourism Center
11	Memorandum between EB IFAS in the Republic of Kazakhstan and CAREC	17 November, 2020 Almaty	Implementation of the project "Greening the drained bottom of the Aral Sea: piloting a closed root system for growing saxaul"
12	Memorandum of Understanding between the ID IFAS in the Republic of Kazakhstan and the AIFC Green Finance Center	14 December, 2020 Almaty	Green Finance Partnership

2. Ecology and tourism

In the field of ecology and tourism, the events such as foundation of a scientific-tourist center “EcoAral”, GIZ project on ensuring the safety, conservation and development of fish stocks in the Northern Aral Sea region, expeditions to Aral Sea basin and the Northern Aral Sea region, in with participants from Central Asia (EB IFAS, GIZ, Demonstration Tour of water specialists from CA and Afghanistan to Kazakhstani part of the Aral Sea region (EB IFAS and CAREC) have been organized. Moreover, the events such as Annual Summer School of Undergraduates of the Kazakh-German University in the Aral Sea region, a buggy expedition from Caspian to Aral Sea and annual winter fishing tournament “Aral Fish” are also organized on a yearly basis. Also, there is a conceptual idea of creating a Geopark based on the Barsakelmes nature reserve.

3. Water resources and water use

Meetings of the Aral-Syrdarya Basin Council

Since 2017, GIZ, together with the EB IFAS in the Republic of Kazakhstan, has been facilitating the organization of meetings of the Aral-Syrdarya Basin Council, increasing the availability of clean potable water in the most remote rural settlements of the Aral Sea region, and providing targeted social and economic assistance to the most vulnerable segments of the population. Today, the meetings of the Basin Council of the Aral-Syrdarya water management region have become indicative for other Basin Councils of Kazakhstan; in addition, this experience is already being adopted by representatives of the water industry of Uzbekistan [4].

Training Center of the Aral-Syrdarya Basin Council

The main activity of the Training Center is aimed at organizing training seminars in the field of rational use of irrigation water in rice systems, the dissemination of innovative technologies for the management and accounting of water resources and other water saving measures on irrigated lands in the Syrdarya river basin.

4. Socio-Economic Issues

EB IFAS in the Republic of Kazakhstan with the technical and financial support of the World Bank together with the Ministry of Labour and Social Protection of the Population of the Republic of Kazakhstan, Industry Associations, universities of the republic, as well as the National Chamber of Entrepreneurs “Atameken” is carrying out a major project “Development of labour skills and stimulation of jobs”. For 2018–2019 under the leadership of EB IFAS in the Republic of Kazakhstan, 40 Professional Standards were developed covering the areas of Agriculture, Water Management, Forestry and Wildlife, which were approved by the National Chamber of Entrepreneurs “Atameken” and put into effect.

In addition, there is a promotion of social development of the Aral Sea region, which includes the development of transport, food delivery from other regions of Kazakhstan, organization of events for children etc.

5. Improvement of the legal and institutional structure

The EB IFAS office has moved to the building of the MFA Representative Office in Almaty. Moreover, an office building was purchased for the branch of the EB IFAS in Kyzylorda.

10 hectares of land have been acquired for the establishment of the Scientific and Tourist Center “EcoAral” in the Aral region, the coast of Lake Kamystybas. The right to run the Kokaral hunting farm on 47 thousand hectares was obtained, where hunting is prohibited all year round. EB IFAS became the only founder of the International Center of Hydrology in Almaty and its branch has been opened in the city of NurSultan – “International Center for Water Assessment”. A new website of the EB IFAS – www.kazaral.org has been developed and is functioning nowadays.

Regarding EB IFAS staff, 23 employees, including 4 candidates of sciences, 4 hydraulic engineers, 3 hydrogeologists, 4 ecologists, and a hydrologist work there. There is an expert group of 35 people as well [4].

Solving the Aral Sea’s problem completely will affect Kazakhstan’s ecological and economic development and will surely be beneficial for the people and animals that inhabit this area. The given activities of the EB IFAS in the Republic of Kazakhstan are estimated to help the lake recover and return its water, bringing more living creatures, such as plants and animals to this area. This helps to protect local people from various illnesses, provide social and economic assistance to them and find a way to rationalize water consumption for irrigation. In conclusion, it can be said that all the activities are very effective. Thanks to the government’s activities, the international cooperation and investments and the innovational eco tourist programs, the Aral Sea’s ecological problem can be solved.

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**КОНЦЕПЦИЯ ДИЗАЙН-ПРОСТРАНСТВА ИСТОРИЧЕСКОЙ
ЛОКАЦИИ СЕВАСТОПОЛЬСКОГО ГОСУДАРСТВЕННОГО
УНИВЕРСИТЕТА НА УЛИЦЕ ГОГОЛЯ**

**THE CONCEPT OF THE DESIGN SPACE OF THE HISTORICAL LOCATION OF
SEVASTOPOL STATE UNIVERSITY IN GOGOL STREET**

Аннотация. Данное исследование направленно на оценку текущих пространственных условий на территории Севастопольского государственного университета и разработку рекомендаций по разным стратегиям в благоустройстве общественных территорий и интеграцию их в окружающую городскую среду. Инновационные технологии позволяют по-новому планировать, формировать новые приемы и организацию пространственной среды с учетом его доступности, функциональности и эстетического восприятия. Реставрация исторических сооружений и общественных территорий, является одной из прерогатив государственных программ. В процессе работы использованы методы комплексного анализа, которые составляют: натурный, статистический, графоаналитический, структурно-функциональный, морфологический, а также тестирование, соцопросы. В результате исследования общественных пространств территории был выявлен ряд проблем и предложены рекомендации с учетом развития и сохранения исторических традиций, а также новых методов организации, гибкости пространства, функциональности и эстетического восприятия.

Abstract. This study is aimed at assessing the existing conditions on the university's territory and developing recommendations on various strategies for the improvement of public areas and their integration into the urban environment. Innovative technologies make it possible to plan, form new techniques and organize the spatial environment in a new way, taking into account its accessibility, functionality and aesthetic perception. Restoration of historical buildings and public territories is one of the prerogatives of state programs. In the course of the research, the methods of complex analysis were used, which are: full-scale, statistical, graphoanalytic, structural-functional, morphological, testing and other techniques, approaches that ensure the achievement of the main goal by solving the tasks. As a result of the study of the public spaces of the territory, a number of problems were

identified and recommendations were proposed, taking into account the development and preservation of historical traditions, as well as new methods of organization, flexibility of space, functionality and aesthetic perception.

Ключевые слова: общественное пространство, зона рекреации, планирование организации, городская среда, объект культурного наследия, Севастопольский государственный университет, улица Гоголя.

Key words: public spaces, recreation area, planning of organization, urban environment, object of cultural heritage, Sevastopol State University, Gogol Street.

In the twenty-first century, special attention is paid to historical educational centers, primarily to the preservation of national traditions, but at the moment the processes taking place in society require a thorough study of these issues and the modernization of the space. There is a state university in the city of Sevastopol, one of the locations of which is the Polytechnic Institute, which is an object of cultural heritage of regional significance. At the moment, there are a number of problems with functioning, reconstruction of buildings and improvement of public spaces is required, fragmentation of the landscape, lack of recreation areas.

The purpose of the study is to analyze the public spaces of the Institute's territory, identify problems and propose a number of recommendations taking into account the development and maintenance of historical tradition, as well as new methods of organization, flexibility of space, mobility, functionality and aesthetic perception. In the process, methods were used, including various methods and approaches of information-statistical, parametric, analytical, cognitive and other aspects, which were accompanied by: photofixation, measurements, testing, – review and systematization of foreign and domestic design and theoretical developments on the research profile; full-scale, information-statistical, morphological, structural-functional, and other techniques that contributed to the analysis and formulation of results.

Gogol Street, located in the central district of Sevastopol, between Ushakov Square and Khrustalev Street, was the outskirts of the city before World War II. Rapid construction began in the 1950s and 1960s. After the end of the war, the street was built up only 300 meters, which had a beginning from Ushakov Square [1; 2].

In Gogol Street 14 is the Polytechnic Institute of Sevastopol State University, which is the only one in the region that provides training for the instrument-making, machine-building and automotive industries. The building of the Institute is a cultural heritage of regional significance, about 170 meters long. Initially, the construction was carried out according to the project of architect Boris Mitnik in 1950, intended for a shipbuilding college. In 1960, in connection with the creation of an instrument-making institute in the city, the technical school moved to the building of the former Kist hotel in Nakhimov Square, and the entire complex of educational premises on Gogol was transferred to the university. The building of the Polytechnic Institute tends to the style of Soviet neoclassicism, based on the heritage of antiquity and Renaissance, as well as many buildings in Gogol Street [3; 4].

The structure is a two- or three-storey building, of a complex plan, “L”-shaped, with side wings forming a kurdoner with green spaces along Gogol Street. In front of the facade of the Institute Building there is a fence decorated with a geometric pattern metal lattice, along the upper belt with rings topped with pine cones (Figure 1).



Figure 1. The facade of the Polytechnic Institute Building

Sevastopol Instrument-Making Institute began its life in 1951 as the Sevastopol branch of Nikolaev Shipbuilding Institute. Over a 60-year period of development, it has become a major educational and scientific center, the only polytechnic university in the Crimean region. At the moment, the university trains specialists in 16 areas and 24 specialties and is a center for the introduction and development of new learning technologies.

Nowadays, in the world special attention is paid to the modeling and quality of the environment of educational institutions, not only internal but also external [6; 7]. Modern technologies will allow us to create a high-quality environment of the territory that is a monument of cultural heritage, while preserving and developing the historical and cultural potential not only of the territory, but in particular of the environment of the historical city of Sevastopol. The choice of the boundaries of the territory of the Polytechnic Institute of Sevastopol State University was focused on the marking of the cadastral map (Figure 2). On the territory there are a number of public places including parking, patio, garbage collection area.



Figure 2. The cadastral map of the territory of the Polytechnic Institute of Sevastopol State University

A number of problems have been identified on the territory:

1. Problems of the transport framework - parking is located on the territory of the university (Figure 3).

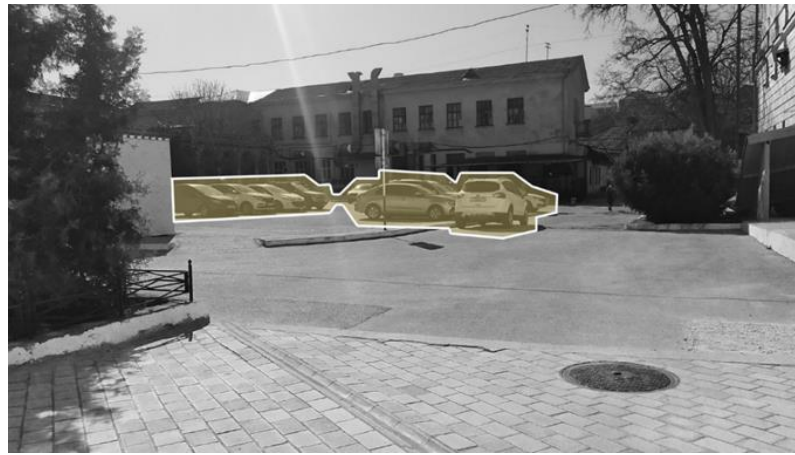


Figure 3. The transport framework parking

2. Problems of functional use – high density of buildings:

- a) there are outbuildings on the territory that perform the function of warehouses
- b) there is a place for garbage collection, it needs improvement (Figure 4).



Figure 4. A place for garbage collection

3. Problems of landscape gardening. The territory needs the development of landscape space, namely:

- a) lawns, trees, flower beds
- b) landscaping, landscaping of the courtyard and the creation of a recreation area
- c) the facade of the building is partially overgrown with tall vegetation (Figure 5).



Figure 5. A place for landscape gardening

4. Socio-economic problems. On the eastern side of the university there are single-storey buildings that function as shops and cafes, having an aesthetically unsightly appearance, often visited by students and university staff.

5. The paving stones in front of the entrance to the building are broken in places, part of the decoration of the metal fence is lost.

6. Partial lack of decoration on the facade.

7. The poster and bulletin board at the main entrance are not aesthetic and violate the design code of this environment (Figure 6).



Figure 6. The poster and bulletin board

Urban planning and design are complex and are becoming more complex as the world faces challenges related to affordability and sustainability. The main public territories of this institute need a new aesthetic and functional program: development of landscape space, restoration of buildings, demolition and replacement of functions, creation of public recreation areas. The courtyard occupies a central place in the plan of construction of the Polytechnic Institute and is one of the key public spaces. Planning of public parking spaces contributes to better accessibility, mobility and elimination of clutter of the territory. The improvement of public recreation areas that meet the requirements of society in the future will concentrate especially intensively functional processes and visited by a large number of people.

The location of the university in Gogol Street needs a model of the organization of the space of public territories of historical cities, taking into account modern requirements, which can be used in the design of such urban formations in the historical urban context. And the design of the concept of the functional and spatial organization of the network of public spaces of the territory of the Polytechnic Institute – the historical location of Sevastopol State University, which, with further development, can be used for implementation.

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**ФОРМИРОВАНИЕ НАУЧНОГО ИНТЕРЕСА К
ИЗУЧЕНИЮ КРЕПОСТИ ЧЕМБАЛО (БАЛАКЛАВА)
SCIENTIFIC INTEREST EVOLUTION IN
THE FORTRESS OF CEMBALO STUDY (BALAKLAVA)**

Аннотация. Рассмотрены отечественные исследования 19–20 вв., освещающие процессы возведения фортификации Чембалло. Отмечено, что в 19 веке дело осложнялось использованием Балаклавской бухты для размещения подводных лодок, что, в свою очередь, не давало возможности проводить археологические исследования в период с 1953 по 1991гг. Масштабные археологические исследования стали возможны только в 90-е годы благодаря совместной деятельности Национального заповедника «Херсонес Таврический» и Государственного Эрмитажа. В качестве результатов археологических изысканий выступают археологические коллекции, передаваемые в полном объёме на хранение в фонды Государственного историко-археологического музея-заповедника «Херсонес Таврический», а также ежегодные археологические отчеты экспедиции, изданные по результатам полевых сезонов, которые в свою очередь послужили информативной базой для дальнейшего написания ряда научных работ. В заключении отмечено, что возможность проведения систематических археологических изысканий на территории средневековых укреплений

выступает весомым аргументом в пользу перспективности комплексного изучения данного памятника в контексте средневековой истории Крыма и всего Средиземноморья.

Abstract. The article considers domestic studies of the 19th and 21st centuries, highlighting the processes of the formation of the Cembalo fortification. It is noted that in the 20th century, the investigation was complicated by the use of Balaklava Bay as a submarine base that made it impossible to carry out archaeological research in the period from 1953 to 1991. And it was only in the 90-s that large-scale archaeological research became possible due to the joint activities of the National Reserve “Tauric Chersoneses” and the State Hermitage Museum. The author emphasizes that the results of archaeological research are the formed archaeological collections, presented in the funds of the State Historical and Archaeological Museum-Reserve “Tavricheskiy Chersoneses”, as well as the annual archaeological reports of the expeditions, which in turn served as an informative base for further writing a number of scientific works. It also stressed that the possibility of carrying out systematic archaeological research on the territory of medieval fortifications undoubtedly serves as a weighty argument in favor of the prospects for a comprehensive study of this monument, both in the context of the medieval history of not only Crimea, but also the entire Mediterranean

Ключевые слова: фортификации Чембало, Балаклава, Севастополь, Херсонес Таврический, Чембальские укрепления, археологические исследования.

Key words: Cembalo fortifications, Balaklava, Sevastopol, Chersoneses Tauride, Cembalskie fortifications, archaeological research.

The fortress of Cembalo is located in the south-east coast of the Bay of Balaklava. Nowadays, modern Balaklava offers “a beautiful site of the Crimean seashore with specific climate and landscapes, as well as interesting historical monuments” [6]. Cembalo fortress is recognized as cultural heritage of Russia. Ruins of medieval Cembalo fortress has preserved well to our days. Its history is closely connected with the Genoese colonization of the Crimea in the 14–15th centuries. The date when the Genoese appeared in Balaklava is unknown. “This episode obviously took place shortly before a devastating raid of the Mongol and Tatar hordes against the Crimea in 1345” [6, www]. fortifications of Genoese Black Sea colonies were of particular interest. The fortress of Cembalo has been little studied by scientists during the last centuries [5, p. 314].

The purpose of the study is to consider scientific interest evolution in studying the fortress of Cembalo (Balaklava) as an object of great interest of the historians, archaeologists, and tourists.

Having analyzed domestic studies of the last century, it should be said that the work of Anatoly Leopoldovich Yakobson (1904–1984) entitled “Medieval Crimea” (1964) deserves special attention [4]. A. L. Yakobson studied the processes of building of the Cembalo fortification, indicated the period of the main construction of the fortress from the beginning in 1357 to 1433, when, according to the author's remark, only the main construction work was completed. Subsequently, construction was resumed in 1463, and later in 1467. A. L. Jacobson, describing the building system, divides the city into two parts, respectively: the upper fortress city of St. Nicholas with the consul's castle and citadel and the lower fortress city of St. George. A. L. Jacobson also mentioned the possible location of the lighthouse at the very edge of the cape [4, p. 127]. “The excellent location of the harbor, which had a natural protection from the storms, the abundance of fish in the littoral waters, and the fertile soils good for growing grapes and other crops, all these features promoted the rapid development of the territory from the most ancient times” [6].

Another research in this area was carried out and presented by Viktor Leonidovich Myts, who tried to outline the main stages of the formation of the Genoese outpost – Cembalo in his monograph entitled “Fortifications of Taurica in the 10th–15th centuries” (1991) [3]. The most relevant for that period plan of the fortification was taken as a basis, with twenty-three buildings from the Middle Ages displayed on it. The plan was dated 1956 [1, p. 133].

The main disadvantages of the provided plan include, first of all, the localization and the name of the Western citadel of the fortifications by the castle of St. George, as well as the designation of St. Nicholas of the upper citadel of the Genoese fortifications. One should say that it happened primarily due to insufficient scientific interest in studying Cembalo fortress. In the 20th century, the matter was complicated by the use of the Balaklava Bay for placing submarines, which in turn did not provide an opportunity for archaeological research of Cembalo.

During the period 1953–1991 scientists from the Moscow Institute of Archeology began to conduct research on the territory of the fortifications in Balaklava, forming a collective archaeological expedition in cooperation with the workers of the National Reserve “Chersoneses Taurichesky”. The resumption of larger-scale works in 2000 is also associated with the activities of the National Reserve “Chersonesos Tauric” and the creation of the Cembalo expedition for joint work with teachers, and later with students of Kharkiv National University named after V.N. Karamzin, the leadership of the expedition was entrusted to N.A. Alekseenko from the reserve.

The expedition, which worked until 2013, in the first years of its work, paid special attention to the remains of a small temple, which constitutes a single complex with a consular castle. Hence its most common name is “Consular Church”, which was erected at an altitude of 45 meters above sea level in the western part of Kastron.

At the same time, in 2002, the joint South Crimean expedition of the Crimean branch of the academy of sciences of Ukraine and the State Hermitage headed by S.B. Adaksina proceeded to the exploration. Then one of the results of their work was the data introduced regarding the corner tower of Barnabo Grillo, named in accordance with the inscription of XV century.

It is worth noting that this archaeological expedition, which was transformed in 2014, together with the experts of the State Museum-Reserve “Chersonese Tauric” and the State Hermitage under the leadership of Viktor Leonidovich Myts, Svetlana Borisovna Adaksina and the assistance of a senior researcher at the Institute of Archeology of Crimea, Russian Academy of Sciences, Sergei Vladimirovich Ushakov has been working until present.

In general, over the years of archaeologists’ work on more than 3000 m² of the excavation area, part of the fortress citadel, located along the curtain of the eastern defensive wall, residential buildings have been explored, three Christian churches and three towers have been fully excavated., Important information has also been obtained making possible to study the structure of the water supply system of the medieval city and its infrastructure. More than 500 people managed to become members of the expedition. Among them are not only employees of Chersoneses and the State Hermitage, but also students from Moscow, St. Petersburg, and Sevastopol universities and a number of other higher educational institutions of the country.

The results of archaeological research are the formed archaeological collections, presented in the funds of the State Historical and Archaeological Museum-Reserve “Tavricheskiy Chersoneses”, as well as the annual archaeological reports of the expedition, which in turn served as an informative base for further writing a number of scientific works, monographs, articles for researchers such as: S. B. Adaksina, N. A. Alekseenko, S. G. Bocharov, N. V. Ginkut, S. V. Dyachkov, V. L. Myts, E. V. Nedelkin, E. N. Stolyarenko, I. B. Teslenko and many others.

At the same time, pointing out the effectiveness of the conducted archaeological research, one should mention the exhibition “Under the shadow of the cross of St. George. Fortress Cembalo according to archaeological data”, organized by the staff of the State Museum-Reserve “Chersonesos Taurichesky “. During the exhibition (June 3–30, 2021), more than two hundred artifacts were discovered on the territory of the Cembalo fortress. Among the exhibits in particular were architectural fragments of the portal of the Consular Castle of Cembalo with a coat of arms carved with a roaring lion in a crown, over which the Genoese flag is visible. Various fragments of weapons were also shown: cannonballs of the 15th century, iron fragments of plates from armor of the “Brigantine” type, as well as small and larger elements of tableware and household items, various decorations and much more.

Thus, having analyzed the main points in the process of the formation of scientific interest in the study of the history of the Cembalo (Balaklava) fortress, it should be concluded that this issue has received due attention only in recent years.

The possibility of carrying out systematic archaeological research on the territory of medieval fortifications undoubtedly serves as a weighty argument in favor of the prospects for a comprehensive study of this monument, both in the context of the medieval history of not only Crimea, but also the entire Mediterranean, and in the light of the uniqueness of one of the few examples of medieval fortification art.

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**ИССЛЕДОВАНИЯ ИСТОРИИ КРЕПОСТИ ЧЕМБАЛО В XIX-XX ВВ.
19th–20th CENTURY RESEARCH OF THE CEMBALO FORTRESS**

Аннотация. В данной работе освещен вопрос степени научного интереса в 19–20 вв. к исследованиям истории крепости Чембало – средневекового крепостного укрепления, руины которого в состоянии относительной сохранности расположены в пределах современного города Севастополя в южной части Балаклавы. На протяжении длительного периода основными источниками, содержащими некоторые сведения о Чембало – одной из стратегически важных генуэзских колоний – являлись немногочисленные эпиграфические и нормативные памятники. Сделан вывод о том, что сведения, содержащиеся в работах ученых того времени недостаточно информативны в виду отсутствия возможности производить систематические археологические исследования.

Abstract. The paper considers the nineteenth-twentieth century research of the history of the Cembalo fortress, the medieval fortification the ruins of which are located within the boundaries of the present-day city of Sevastopol in the southern part of Balaklava and are relatively well preserved. For a long period, the main sources containing some information about Cembalo, one of the strategically important Genoese colonies, were a few epigraphic and normative monuments. It is concluded that the information given by the scholars of that time is not very informative because of the lack of opportunity to conduct systematic archaeological research which would prove or refute some of their hypotheses. Still, their works mark a certain stage in the formation of scholarly interest in the history of the Cembalo Fortress.

Ключевые слова: археология, Чембало, Балаклава, Севастополь, фортификация, Чембальские укрепления, Таврическая губерния.

Key words: archeology, Crimea, Cembalo fortress, Balaklava, Sevastopol, fortification, Cembalo fortifications, Tauride province.

Historically, Crimea existed at the intersection of different cultures and religions. It was in Korsun (Chersonesos Tauride) in Crimea that the christening of Prince Vladimir took place in the 10th century, which marked the beginning of the adoption of Christianity in Russia. In the first half of the 13th century, Islam began to spread in Crimea, which was the basis of the lifestyle of the population and the state religion of the Crimean Khanate for a long time [9, p. 314]. Crimea possesses rich cultural heritage that dates many centuries back and is the common heritage of the peoples of Russia. Cembalo fortress is recognized as a monument of the cultural heritage of Russia.

The purpose of this paper is to analyze the research of the Cembalo fortress history – a medieval fortification, the ruins of which in a condition of relative preservation are located within the modern city of Sevastopol in the southern part of Balaklava.

Crimea (or the Tauric Peninsula) has been at the boundary between the classical world and the Pontic-Caspian steppe. Its southern fringe was colonized by the Greeks, Persians, Roman Empire, Byzantine Empire and the Principality of Theodoro. During this period, the population of its urban areas consisted of Greek-speaking Christians. During the collapse of the Byzantine state some cities fell to its creditor, the Republic of Genoa and after that all of them were absorbed by the rapidly rising Ottoman Empire. From the 15th till the 18th century, Crimea was a part of the Crimean Khanate, a dependency of the Ottomans.

For a long period, a few epigraphic and normative monuments had been the main sources containing some information about Cembalo, one of the strategically important Genoese colonies of the 14th–15th centuries. The starting point in the history of the research into the monuments of the Genoese medieval fortification in the territory of the Crimean Peninsula can be attributed to the 19th century.

Peter Ivanovich Keppen (1793–1864), a famous ethnographer, economist and historian, one of the founders of the Russian Geographical Society, is undoubtedly among the “pioneers” in the study of the Genoese presence on the peninsula.

Among the 40 scientific works that were devoted to the Crimean Peninsula by the researcher, the work “Crimean collection. About the antiquities of the southern coast of Crimea and the Tauride mountains” [2] should be mentioned in the first place. Relevant systematized information about the medieval period in the history of the peninsula is combined with objective assessment made by the author. For example, he considered the Turkish influence on the development of the network of Genoese possessions in Crimea. It can supplement the general idea of the issues raised in this study. These include issues related to the dating of the foundation of Cembalo by the Genoese, which the author attributed to 1365.

It should be noted that during that period (19th century), research of such type was gaining popularity. Approximately at the same time, namely in 1837, another no less outstanding domestic historian Nikolai Nikiforovich Murzakevich (1806–1883), a researcher of Crimean antiquities, published a work under the title “History of Genoese settlements in Crimea” in Odessa [4]. This monograph was based on the results of his own ten-year study of the surviving traces of the Italian fortifications of the Crimea. In that work N. Murzakevich presented his concept of Cembalo development periodization, highlighting the following historical periods:

- 1) Scythian (2nd – 1st centuries BC);
- 2) Greek-Byzantine (until 1365, when a small settlement named Yamboli was under the control of Genoa);
- 3) The first Genoese period (1365–1433). After the uprising of the townspeople and the residents of the surrounding villages, the Genoese authorities were forced to leave the city. Cembalo got under the control of the Feodosia prince Alexei.
- 4) Theodorite (1433–1434). The short duration of that period can be explained by the Genoese-Feodorian military conflict that broke out in 1433–1434, as a result of which the Genoese managed to return the territories they had lost earlier;
- 5) The second Genoese period (1434–1475). The last period of the Genoese Balaklava ended with the events when Cembalo, along with other Crimean fortified cities following Kafa, fell under the onslaught of the army of the Ottoman Sultan Mehmed II (1432–1481) in 1475;
- 6) Ottoman-Tatar (1475–1783). This period ended as a result of the Turkish defeat in the Russian-Turkish war of 1768-1774 and the subsequent annexation of the Crimean lands to the Russian Empire in 1783 with the transformation of this territory into the Taurida province in 1784 [3, p. 60].

This periodization was based on the information from the texts by the P.I. Keppen and I.P. Blaramberg, which Murzakevich referred to, as well as a number of other sources. It should be noted that up to this day many researchers have adhered to the above periodization of Murzakevich, making minor clarifications to it when speaking about the history of the formation and development of Balaklava.

In “History of Genoese settlements in Crimea” little attention was paid to the description of the area, in contrast to Murzakevich’s article “A Trip to the Crimea in 1836”, published in 1836. Not only did the author describe the observations he made while visiting the ruins of the fortresses of Cembalo, Kafa and Soldaya, but for the first time he put forward and substantiated the opinion according to which Cembalo was a strategic stronghold in the South-West of the peninsula in the system of Genoese colonial possessions [4, p. 654–656].

Holding the post of vice-president of the Odessa Society of History and Antiquities established in 1839 for quite a long time, Murzakevich was not alone in dealing with the issues of the Genoese medieval trading posts in the Crimea. This can be deduced from the analysis of the sources that were published on the pages of the Society’s “Notes” and from the fact that over 20 publications were presented within the framework of this periodical, including the results of the research conducted by the Vladislav Norbertovich Yurgevich (1818–1898) [8]. A talented translator and close associate of Murzakevich, V.N. Yurgevich also contributed to the study of Genoese epigraphic monuments, which was reflected in four of his thematic publications devoted to the inscriptions from Cembalo, Soldaya and Kafa which he discovered personally or re-deciphered. Of the four Cembalo inscriptions which had been taken to Genoa, Yurgevich managed to work only with two: the earlier slab dated 1463 and laid under the consul Barnabas Grillo [7, p. 319] and the slab dated 1467, the reign of another consul, Mr. de Olive [7, p. 320].

And some time before that, in 1861, Yurgevich made a trip to the Crimean monuments. He discovered a slab dating back to 1357. It was located in one of the walls of the temple of the Twelve Apostles. According to the author, this inscription could act as irrefutable evidence to the theory of dating the transfer of these lands to the possession of the Genoese consuls. Yurgevich did not attribute the time when the Italians began settling Balaklava to 1365, in contrast to the above assumptions of P.I. Keppen, but linked those events with the fall of Kafa after the 1204 onslaught of the Genoese.

Less than a century later, attention was paid to described Cembalo by Alexander Lvovich Berthier-Delagarde (1842–1920), an outstanding Crimean scientist, engineer, archaeologist, historian, vice-president of the Odessa Society of History and Antiquities, in his work “Investigation of some puzzling issues of the Middle Ages in Taurida” (first published in Odessa in 1914 and republished on the pages of “Izvestia of the Tauride Scientific Archival Commission” in 1920). In particular, Berthier-Delagarde raised the issue of the final territorial boundaries of the Cembalo consulate in the 14th–15th centuries.

In the 20th century, both Russian and foreign researchers continued to dwell upon some aspects of the history of the fortress complex on the shores of the Balaklava Bay. Among them was the Italian L.A. Maggioroty, who dealt with the processes of erection and modernization of the fortress walls of Cembalo fortifications. In particular, the author claimed that before the arrival of the Genoese, Greeks had already founded their settlement and lived in this territory. It was noted that construction works in the territory of the future Cembalo fortification were started by the Genoese in 1357 [1, p. 122]. According to the author, the final formation of the urban defensive structure did not occur until the second half of the 15th century. This is confirmed by the foundation slab of the consul Baptista de Oliva dated 1467 and an earlier slab by another consul named Barnabo Grillo dated 1463.

Despite the fact that travellers’ noted of the 18th – early 20th centuries were the only source base available to Maggioroty, he gave a plan of the city, dividing the city territory into three parts: the suburbs, the “Upper Castle” of St. Nicholas and the “Lower City” of St. George. However, the authors made inaccuracies, for example, in indicating the location of the upper castle of St. Nicholas, which, according to the Italian researcher, was erected at the very top of Mount Castro. In fact, the building was located to the west of the mountain itself [1, p. 107–108].

Speaking about the works considered above, it is necessary to point out that their authors had no access to archaeological finds or to the results of complex archaeological works which would prove or refute some of their hypotheses. Still, their works mark a certain stage in the formation of scholarly interest in the history of the Cembalo Fortress.

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ОСНОВНЫЕ ЗАБЛУЖДЕНИЯ В ОБЛАСТИ ЭКОЛОГИИ MAIN ILLUSIONS IN THE FIELD OF ECOLOGY

Аннотация. Цель данного исследования заключается в том, чтобы выявить разницу между тем, как обычный человек воспринимает процессы, связанные с окружающей средой,

находясь под влиянием средств массовой информации, и реальными научными фактами о проблемах окружающей среды. В нашем исследовании мы изучаем такие факты как: изменение климата, сравнение уровня выбросов углекислого газа от бензинового и электрического автомобиля, реальные вредные выбросы от автомобилей, опасность ртутного загрязнения для человечества. Данное исследование привело нас к пониманию того, что многие проблемы окружающей среды распространяются по миру в экономических целях транснациональных корпораций, в то время как многие иные проблемы всё еще не решены, но при этом имеют гораздо более опасные последствия, чем описанные в первом случае. Также цель исследования заключается в том, чтобы повысить осведомлённость населения о реальных экологических угрозах, и чтобы они не заостряли своё внимание на информации из антинаучных популярных новостей. В выводе мы рассматриваем такой факт, как ртутное загрязнение окружающей среды, проблему, которая не нашла своего решения до наших дней.

Abstract. The purpose of the research is to show the difference between how an average person understands environmental processes being under an influence of mass media and real scientific facts about our environmental problems. In our research, we explore real facts such as: climate change, comparison between CO₂ emissions from gasoline and electric cars, real harmful emissions from cars, the danger of mercury to mankind. Research made as realize that many of environmental problems are being publicized around the world in economic purposes of multinational corporations, while other problems are not solved yet, but are still more dangerous than first ones. The aim is also to raise people's awareness about real ecological threats and not to focus their attention on fictional and fake news. In conclusion, we are considering such a fact as mercury pollution, the problem, which has no real solution up to these days.

Ключевые слова: глобальное потепление, изменение климата, загрязнение, двигатель внутреннего сгорания, топливо, выбросы, проблема окружающей среды

Key words: global warming, climate change, pollution, internal combustion engine, fuel, emissions, environmental problem

It is said that nowadays mankind lives in an unsustainable world with daily changing social and biological conditions. While the first process of social imbalance and social injustice is up to politicians and they cope with such problems every day, the second one is the most dangerous due to the fact that a big number of scientists are involved in researching the way how to help our humankind survive in our complicated world of harsh weather and climate conditions, but the number of those scientists is always not that big and not enough to change something radically in our world. Moreover, there is such a problem that their researches are often unavailable to the public because of the mass-media distorts the real facts.

For instance, there is a huge problem of people understanding a process of global warming. Many people think that global warming leads to extinction of humanity and caused by releasing greenhouse gases (such as carbon dioxide) into atmosphere by burning fossil fuels, which leads to raising an average temperature in the world up to 3°C and as a result many animals are in great danger, like the polar bears, which may become extinct. The fact is that according to many researches it is better to say not “global warming” but “climate change”.

Imagine a situation. Owner walks his dog. As you can see – the owner walks his dog and the dog is all over the place leaping and bouncing sometimes upwards, sometimes downwards, but you notice the owner – he is the trend and he determines where they both will be in a couple of minutes. The dog can drastically change its direction, but only the owner is heading that direction. The owner is a long-term trend, the dog is the variation around this trend or the owner is a climate, the dog is a weather. That means that even when a person notices that a winter two years ago was quite colder than this year and his children couldn't make a snowman because of lack of the snow this year, that

doesn't confirm the global warming. All the average person can say is that two years ago he had the ability to make a snowman and now he hasn't got a snowman in his courtyard. The reason for that is our planet [2]. Over long periods of time planet Earth was moving in the space getting closer to the sun or moving away from it. That results in an amount of solar radiation consumed by the surface of the Earth including the oceans and even polar ice caps. When radiation hits the surface, it becomes heating it, warming up and the biggest effect we can see are polar ice caps – they melt. Polar ice caps melting causes a huge release of freshwater into the oceans. Mixing with saltwater violates the density of water and makes ocean currents move in different ways. Taking into account the fact that ocean currents move vast amounts of heat across the planet (for example, the Humboldt current can affect climatic conditions around the world), it is no question that current's directions changing in present can change the whole climate on different continents. As a result, causes of snowfall in Australia are more common these days and it is obviously that there is no reason to talk about global warming – global climate change is on the agenda nowadays. Moreover, this process is based only on space processes with its solar radiation, which is under our control. The currently generated amount of energy by human in the world in relation to the energy of solar radiation absorbed by the earth annually is only a few percent of its periodic natural changes. Therefore, even a threefold increase in energy production by man should not affect the global climate change of the planet.

But it would be non-objectively to tell you that carbon dioxide doesn't effect on climate – moreover, without the greenhouse effect, the average annual temperature on Earth would be -18°C (average annual temperature of the earth's surface in real life is $+15^{\circ}\text{C}$), so let's talk about regions under a threat of overheating, caused by greenhouse gases emissions. The main greenhouse gas is carbon dioxide and it became very popular to talk about negative influence of cars with internal combustion engine on climate change – that is the second popular illusion. But it is noticed in a number of works that 95% of the world's carbon dioxide emissions are carried out by such natural sources as: breath of terrestrial vegetation (24%) and the soil (24%), ocean surface emissions (41%) and volcanic activity ($<1\%$). Remaining 5% is up to burning fossil fuels. According to the topic «CO₂ emissions by fuel» by Hannah Ritchie and Max Roser we can see cement production on the fourth position: coal, oil and gas are the top three factors of carbon dioxide emission, and oil is not the first.

In our days, solid and liquid fuel dominate, although we can definitely say that there is a demand in gas production too. Cement and flaring at the global level remain comparably small. It is worth to mention that flaring means a process of setting natural gas on fire on order to release it into atmosphere (as world governments are banning the process of releasing a natural gas, people used to burn it not to release methane component).

The trends vary significantly by region [8]. Overall patterns across Europe and North America are quite similar: the process of early industrialization took place with consuming a lot of solid fuel, however, through time this energy mix has diversified. Today, CO₂ emissions are spread fairly equally between coal, oil and gas. For example, Latin America has never consumed coal in great values even long time ago when coal was used everywhere – historically emissions remain a product of liquid fuel in this region. Asia's energy remains dominant in solid fuel consumption and has notably higher cement contributions relative to other regions. Africa also has more notable emissions from cement and flaring.

In the United States or the UK, for instance, oil and gas are the largest contributors. In China and India, coal is much more dominant. In Russia, it's gas. Taking into account that oil is used not only in a car industry – oil production is a diverse combination of factories which are using huge amount of oil, power plants, military industry and etc. – we can definitely say that gasoline vehicles are not that harmful and can't cause greenhouse effect itself. Even if you think that internal combustion engines both gasoline and diesel produce some amount of CO₂ emissions and we all have to drive battery electric vehicles in order to try to save our planet from greenhouse effect – the truth is that electric cars are producing the same and in many studies we can see that they produce even bigger amount of carbon dioxide than gasoline and diesel cars.

The Ifo Institute for Economic Research (is a Munich-based research institution) carried out an experimental research [4] and warned us about the interesting fact that cars with electric engine

are “no panacea” against climate change. The research decided to make a comparison in CO₂ footprint of a Tesla Model 3 and a Mercedes 220d running on diesel engine. They also took a Mercedes C Class model converted from petrol to liquefied natural gas (LNG). Taking into account the whole life of a car estimated in 150.000 kilometers, the research found out that CO₂ emitted during manufacturing the battery and fuel production, as well as generation of electricity, suggests the Tesla 3 electric car leaves the heaviest carbon footprint of the three, at least within the context of Germany's energy mix. Furthermore, it is worth mentioning that the whole process of making an electric-powered vehicle and a combustion engine car creates the same amount of CO₂ — 8.6 tons per car, with the difference in a demand of recycling a battery in Tesla Model 3. This car is the one to have the most significant impact on the climate and it has the biggest volumes of produced carbon dioxide. The main reason for a customer to buy an electric vehicle is only in economics: A Volkswagen Golf electric car costs €33,000 in Norway [1].

A similar car with an internal combustion engine will cost €22,000. However, owners of electric cars are exempted from CO₂ taxes – € 4,348, VAT (value added tax) – € 5,512, and weight tax – € 1,715, and adding with such bonuses as free parking in municipal parking slots, all that means that it is much cheaper to have an electric car in Europe despite its high cost when you buy it. Moreover, these days company stock prices are rising when a corporation proclaims new vectors of development and makes a policy aimed at saving nature by using widely their brand-new electric technologies. As you can see in previous statistics, all that doesn't make a great breakthrough in the field of ecology, but it makes a great budget to such companies as BMW and Tesla. Pictures show you stock prices of these two corporations in time and it is clear that half a year to make a company stocks rise in two in the example of BMW and in ten times in the example of Tesla is a non-natural economical process based on the news of new inventions in ecology [3].

The real danger is in the driving process and it is not about carbon dioxide emissions: while driving your gasoline or diesel vehicle it produces in real time some amount of heavy metals such as NO_x (Nitrogen oxide) and CH₄ (Methane) and these metals contaminate the nature, while electric cars leaved those very steps on the stage of producing a battery. The question is, what is more harmful – to produce NO_x on driving or leave the duty of exhaust cleaning to factories and enterprises, which produce and source lithium for batteries in undeveloped countries, often using child labour, which is under our control. The answer is that all modern automobiles nowadays are driven by modern engines with such technologies as using catalyst, recirculation system, exhaust gas afterburning and etc. and all that is provided by European emission standards, which means that governments and car manufacturers are actively working to reduce harmful emissions from combustion-powered cars. For example, at present, when a new car is going to be sold in Europe, it must pass by special criteria called European emissions standard – the latest is known as Euro 6 [6].

These standards are used to ban old technological developments fixed in a car in order to produce less carbon dioxide. Euro standards are updating all the time. Thus, Euro 7 standard is going to come till 2025 year, which reduces levels of pollution produced by internal combustion engines to the level of non-exhaust zero-emission technologies. Consequently, we can see that we can easily reduce the amount of pollution generated by gasoline and diesel vehicles, but it is much more difficult or even unreal to lessen harmful contamination from manufacturers of lithium metals in third world countries.

Let us continue with the third worth-to-mention illusion. All the information provided above is not so significant and it is not necessary for ordinary people to talk about what is less damaging – gasoline cars on the left hand or electric vehicles on the right hand – because Emissions Analytics company carried out a research [5] which results with a fact – “Pollution from tyre wear can be 1,000 times worse than what comes out of a car's exhaust”. The problem is that we can indefinitely try to reduce pollution effect provided by an engine, because there are many and many types of engines to choose from, but we can't imagine driving our cars without tyres and effective breaks.

Harmful particles from tyres and even brakes are a very serious and growing environmental problem, intensified by the growing popularity of such heavy vehicles as SUV (sport utility vehicle) and the growing demand for electric vehicles which are heavier than standard vehicles because of the

weight of its battery. Thus, Tesla Model S weighs from 2027 to 2263 kilograms, while BMW 5 G30 varies from 1695 to 1770 kilograms. A heavy car always needs more power to slow down, which means that a heavy car's brake disks are erasing more often than in an average car. What's more, emissions from wearing tyres are not regulated at all. In contrast, exhaust emissions are being rapidly reduced due to the pressure placed on them by European emission standards.

Currently, new cars are producing very little particulate matter, but there is growing concern about "non-exhaust emissions". To understand the value of the problem, Emissions Analytics, the world's leading independent test and data analytical organisation for scientifically measuring real emissions, made several tyre wear tests. They got a popular family hatchback running on new, properly inflated tyres and found out that that car emitted 5.8 grams of particles per kilometer, which is a lot more in comparison to the regulated exhaust emission limits from internal combustion engines of 4.5 milligrams per kilometer. That is more than 1000 times higher than fully unregulated tyre wear. Emissions Analytics notices that this result could be even bigger if the vehicle had under-inflated tyres, or the road surface used for the test was rougher, or even if the tyres used were made of a low-budget range material – these are all very recognizable scenarios in the real world.

What's more, as well as talking about what to do and how to save our planet from pollution, greenhouse gases and reduce the amount of heavy metals right now, the real problem is that we can't do anything to previous footprint of outdated technologies like cars with Euro 3, Euro 2 or even cars with engines without any certification of Euro standards. And the problem is much more common than saving polar bears on polar ice caps, because the problem is in quicksilver. The problem is that it is everywhere nowadays. Quicksilver was produced in high amounts by old cars with outdated euro standards and many of those cars are on the roads up to this day. Getting into the airspace with emissions, mercury falls on the ground or water surface near the sources of pollution and even at a great distance from them transported by atmosphere. In aquatic ecosystems, microorganisms convert it into a special chemical compound called methylmercury [7], which is much more toxic than elemental mercury. In this form, mercury enters food chains and accumulates in aquatic organisms, including fish and shellfish, as well as birds, mammals and humans who eat all these products. In some fish species the concentration of methylmercury can be millions of times higher than the concentration in the water where the fish lives.

Mercury, especially in the form of methylmercury, is extremely toxic to humans. Human fetuses, infants and children are especially vulnerable to the negative effects of mercury, as it primarily affects neurological development. When a pregnant woman eats fish that contains methylmercury, the toxic chemical affects the fetus. In addition, mercury can be present in breast milk, penetrating into the baby's body at very early stage of its development. Children who eat food contaminated with mercury at an early age are at a high risk of getting illnesses. Methylmercury results in brain function, causing impairments in speech, memory, attention, motor skills, and visual perception.

In conclusion, it is worth saying that this report not only showed the horizon of the ecological problems, but also showed the people's awareness level of economical processes or the mass media activity and raise awareness of scientific information.

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**ПРОМЕНАД КАК КОНЦЕПЦИЯ ФОРМИРОВАНИЯ ОБЩЕСТВЕННОГО
ПРОСТРАНСТВА ПРИМОРСКИХ ГОРОДОВ
PROMENADE AS A CONCEPT FOR THE PUBLIC SPACE FORMATION IN
COASTAL CITIES**

Аннотация. В данной статье рассматриваются основные концепции формирования променадов в общественном пространстве приморских городов. Променады включают в себя разнообразные функциональные сценарии и являются важной частью пространства набережной. В статье анализируются променады в городах Севастополь, Геленджик и Ницца и выводятся ряд тенденций, которые можно впоследствии использовать при организации пространства променада в приморском городе.

Abstract. The article discusses the main concepts for public space formation in coastal cities. A promenade has variety of functional scenarios and is an important place of the embankment in

every coastal city. We analyze the most popular tendencies to its organization, because the promenades are a simple way for people to enjoy and get some aesthetical pleasure. For the analyze we chose three cities: Sevastopol, Gelendzhik (Russia) and Nice (France).

Ключевые слова: средовой дизайн, общественное пространство, набережная, променада, Севастополь, рекреационный объект.

Key words: public space, coastal city, promenade, embankment, Sevastopol, Gelendzhik, Nice, architecture, design, recreation.

The issues of the public space forming are important for modern environmental design. Coastal cities have an extensive functional program, recreational and exhibition zones, promenades and esplanades. The embankments are of great interest because they combine two different environments – water and land.

By forming the coastal public space, promenades (Fr. *se promener* – to walk) are the optimal solution for embankments organizing. A promenade is a place for walking. Also, the promenades are located in those places where the visitor has a beautiful view [1]. A large number of promenades both in the Russian Federation and abroad confirms the relevance of this embankment organization type.

The main functional scenario of the promenade is recreational, which implies a leisurely walk, enjoying the views, and getting aesthetic pleasure from being in the fresh air [4]. The promenades (places of large gatherings of people, locals and tourists) also bring commercial benefits, as they are part of the shopping area (commercial aspect). Often, the promenade includes a zone of green spaces, as well as observation decks above the promenade (environmental aspect). Promenades have a social function: they create a public space. People meet to walk, to see each other (Figure 1.1.).

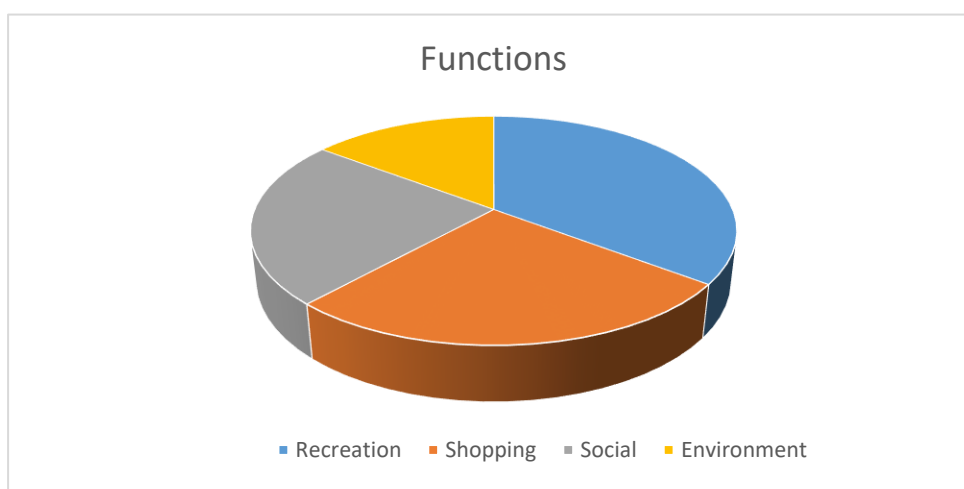


Figure 1.1. Functions of a promenade

The promenades appeared in France. They were originally a place where the elite demonstrated themselves in all their glory and richness. Promenades always were a good issue for artists. Well known are the paintings of Karl Spitzweg (Figure 2.1.-2.2). In the middle of the 19th century, he depicted families on several occasions during the Sunday promenade [3].



Figure 2.1. Karl Spitzweg, Sunday Walk, 1856



Figure 2.2. Karl Spitzweg, The Widower, 1872

After the promenade lost his military function, it became the central location between the city center and the suburbs became popular excursion destinations, which also determined the location of cultural institutions on the promenades (cultural-historical function). In addition, the rapid development of artificial street lighting in the 19th century allowed the promenade to be used safely in the evenings. Further, we will highlight the promenade development trends based on the analysis of promenades in Sevastopol (Crimea, Russia), Gelendzhik (Russia), Nice (France).

Sevastopol is a historic city, which is located on the Crimean Peninsula. The promenade is Kornilov embankment, located in the central part of the city in the Center district. Kornilov embankment (the original name was Primorskaya embankment) is one of the first streets of the city, founded in 1783 (Figure 3.1). The embankment is open from the seaside; therefore, it is vulnerable to the elements. In 2007, Kornilov Embankment was destroyed by a storm, its restoration was timed to coincide with the 225th anniversary of the city in 2008.

The architectural style of the embankment is the monumental style. Kornilov embankment suggests several different routes, the main of which is a tourist one: from Nakhimov Square through the Monument to the Flooded Ships to the end of the embankment near the bay Artbuhta. On the way, tourists get acquainted with the history of the embankment on the memorial plaques, visit souvenir shops and can relax in a cafe. It is also possible to choose a tourist walk along the bays of the city on one of the boats that moor near the parapet of the embankment. This scenario is suitable for any time

of day. The walking scenario is designed for those who do not aim to study the history of the city, but getting aesthetic pleasure from the promenade.

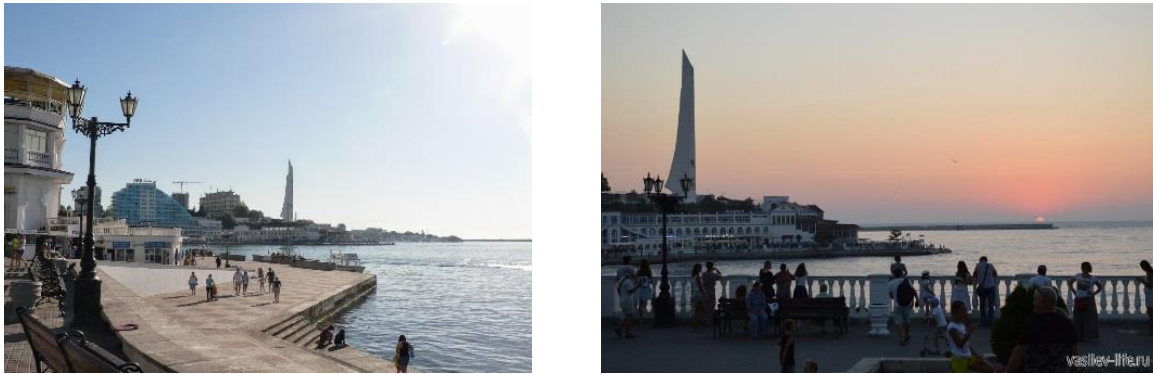


Figure 3.1. Kornilov embankment

Gelendzhik a resort town on the Black Sea coast. It has a historical promenade – Gelendzhik embankment, located in the central part of the city. Gelendzhik embankment also suggests several promenade routes – its southern part is the most in demand for tourists, since the main historical and cultural objects (monuments and sculptures) are concentrated there; a shopping area is organized, as well as a zone of comfortable walking (Figure 4.1.).

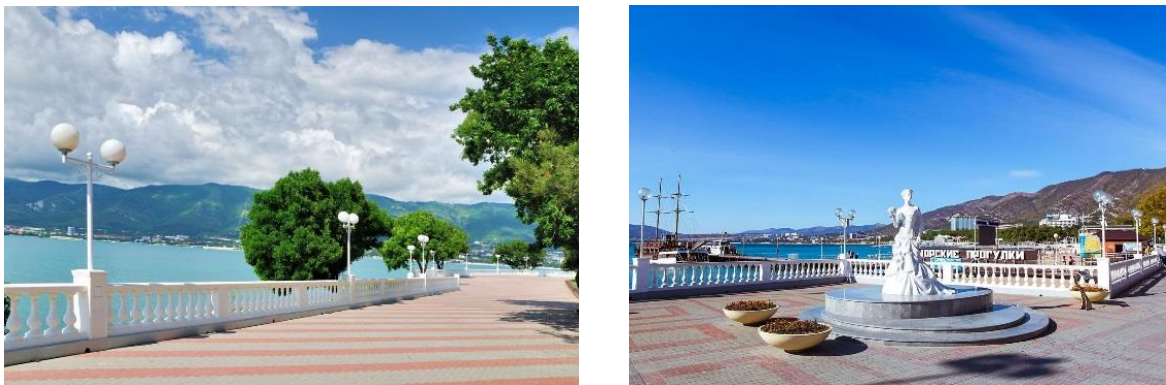


Figure 4.1. Gelendzhik embankment

Nice is a French resort town with an embankment located on the Mediterranean coast. Promenade des Anglais in Nice is stretching along the coast. The main scenarios of the promenade are walking (walking tours for locals and tourists), recreational – there is a line of beaches next to the promenade, sports: designed for cycling (Figure 5.1.).



Figure 5.1. Promenade des Anglais in Nice

In terms of structure, the promenades are long, without a center, and most often have an administrative status. The predominant functional scenarios are: recreational, entertainment, shopping, sports, historical and cultural. Traffic is organized on the promenade: for pedestrians,

service vehicles, cyclists. There are parking spaces near the promenade, including places for the disabled, public transport stops. Mooring of boats and other small-sized vessels (pleasure, tourist, or following a certain route) is allowed on the promenade. On the embankments there are monuments to famous people (writers), memorial signs (in honor of historical events) and groups of genre sculptures (thematic). The promenades are located in the historical part of the city and reflect its traditions and culture. The older the city and the richer its traditions, the more the promenade is full of objects.

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КУЛЬТУРНО-ОБРАЗОВАТЕЛЬНЫЕ ИНСТИТУТЫ ФРАНЦИИ КАК ИНСТРУМЕНТ «МЯГКОЙ СИЛЫ» В БОЛЬШОМ СРЕДИЗЕМНОМОРЬЕ CULTURAL AND EDUCATIONAL INSTITUTIONS OF FRANCE AS A TOOL OF "SOFT POWER" IN THE GREATER MEDITERRANEAN

Аннотация. Тезисы отражают основные положения исследования инструментария «мягкой силы» на примере культурно-образовательных институтов Франции. Автор

анализирует качественные и количественные характеристики проявления “мягкой силы” Французской республики в XXI веке. Акцент сделан на деятельности Французского института за рубежом. Автор приходит к выводу об эффективности институционального механизма “мягкой силы” в достижении внешнеполитических целей.

Abstract. The theses reflect the main provisions of the study of the tools of “soft power” on the example of cultural and educational institutions in France. The author analyzes the qualitative and quantitative characteristics of the manifestation of the “soft power” of the French Republic in the XXI century. The emphasis is placed on the activities of the French Institute abroad. The author comes to the conclusion about the effectiveness of the institutional mechanism of “soft power” in achieving foreign policy goals.

Ключевые слова: международные отношения, “мягкая сила”, Франция, страны Большого Средиземноморья.

Key words: international relations, "soft power", France, countries of the Greater Mediterranean.

American political scientist J. Nye introduced the concept of “soft power” into scientific circulation. He also argued that the country's cultural appeal is a source of "soft power" and described its impact on international relations. One of the instruments of “soft power” is the state's relations in the field of culture, science and education [2].

The 21st century is characterized by tense international relations, so the institutions of "soft power" come to the fore in the international arena.

The French Republic is among the countries that have a serious potential for spreading "soft power" among foreign audiences, especially in Africa.

French is spoken by about 300 million people, 116 million students and 900 thousand teachers of French [1]. In Africa, where it often acts as a “lingua franca” both in interethnic and interstate relations.

The positive image of France is formed on two levels. First level: natural, geographical, historical factors. Second: literature, art, theater, cinema, education [3].

The ruling circles of France are pursuing a conscious policy of positioning the image of the country. We would like to note separately the role of the system of foreign French cultural centers, which have been transformed into a French Institute since 2011. Abroad, it is called, for example, the French Institute in Algeria. The number of institutes depends on historical ties and working conditions. Table 1 shows the number of branches in the countries of the world.

Table 1. Number of branches of the French Institute in the countries of the world

State	Number of branches
1. Morocco	12
2. Lebanon	9
3. Algeria	5
4. Japan	5
5. Israel	4
6. Palestine	4
7. Vietnam	4
8. Indonesia	4
9. Cambodia	3
10. Turkey	3
11. Democratic Republic of the Congo	3
12. Cameroon	2
13. Senegal	2

14. Nigeria	1
15. South Africa	1
16. Haiti	1
17. Russia	1
18. Argentina	1
19. Chile	1
20. Mexico	1
21. Costa Rica	1
22. China	1
23. Uzbekistan	1

As we can see, the geography is quite extensive, especially for the countries of the Mediterranean and Africa. The activities of French institutions abroad are diverse. These are publications of works by French authors in foreign languages; cultural cooperation projects in the form of festivals (up to 200 events are held annually); increasing the level of mobility of representatives of French creative circles abroad and exchanges for work in France (up to 200 people participate annually).

In addition, France tops the ranking of the recently released Soft Power 30 index and report for 2019, published jointly by the consulting company Portland Communications, Facebook and CPD. The rating of “soft power” looks like this [4]:

1. France
2. United Kingdom
3. Germany
4. Sweden
5. USA

Thus, it can be stated that the French institutional mechanism in the field of “soft power” and the popularity of the image of France represent an effective model for achieving the foreign policy goals of their country.

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**РЕСУРСНЫЙ ФАКТОР МЕЖДУНАРОДНОЙ НАПРЯЖЕННОСТИ В
РАЙОНЕ БОЛЬШОГО СРЕДИЗЕМНОМОРЬЯ
RESOURCE FACTOR OF INTERNATIONAL TENSION IN
THE GREATER MEDITERRANEAN REGION**

Аннотация. Целью нашей работы является изучение понятия «ресурса» и его роли, как фактора международной напряженности между государствами Большого Средиземноморья. С целью теоретического исследования основ вопроса международной напряженности определено понятия «ресурс» и «международная напряженность». Проведен анализ ценности некоторых видов ресурсов в различные периоды истории подтверждающий всё большую актуализацию подобранной нами темы. Исследование опирается на методологию, ивент-анализ, контент-анализ, системный подход. В заключении приходим к выводу, что природные ресурсы только способствуют усилению регионального противостояния друг с другом.

Abstract. The main purpose of our work is to study the concept of “resource” and its role as a factor of international tension between the States of the Greater Mediterranean. In order to theoretically study the foundations of the issue of international tension, the concepts of “resource” and “international tension” are defined. The analysis of the value of some types of resources in different periods of history is carried out, confirming the increasing actualization of the topic we have selected. The research is based on the methodology of event analysis, content analysis, and a systematic approach. In conclusion, we come to the inference that natural resources only contribute to the strengthening of regional confrontation with each other.

Ключевые слова: международная напряжённость, Большое Средиземноморье, вода, газ, Турция, Израиль.

Key words: international tensions, the Greater Mediterranean, water, gas, Turkey, Israel, Greece, Cyprus.

Resources in the context of globalization are increasingly acting as a factor of international tension. After all, in order to maintain the existence of the state, it is necessary to consume a lot of resources. And if we are talking about large, economically developing countries, then their needs for

various kinds of resources can reach huge proportions. The development and use of high technologies make it possible to find and extract previously unknown reserves. However, not every state has sufficient stocks of them, so they have to go to all sorts of tricks in order to meet their basic needs. And this, in turn, leads to the emergence of tension in the relationship, which in the future may escalate into a military conflict.

First of all, we will give a description of the “resource” and “international tension” A resource is a set of natural, social and spiritual elements that are used by a person to produce economic benefits [1; 4, p. 37]. Examples are fuel and energy, fossil, food, communication, labor, financial, organizational and spiritual resources.

In turn, this concept of “tension” is most often used as an auxiliary term used to describe the specifics of international relations. At the same time, the term falls into a kind of zone between two opposite states – peace (security) and conflict (war) [7, p. 12–24]. In international relations, it can arise in competition (wars), as well as in cooperation (peace). Tension in competitive relationships has deeper causes, characterized by great stability and the likelihood of developing into an open clash, i.e. conflict.

Tension is the result of a mismatch between the needs, interests and expectations of the parties and the degree of their satisfaction. It is a consequence of first feeling, and then understanding by one side that the satisfaction of its needs, interests and expectations is under threat from the other side.

Tension in International Relations is a certain attitude of the parties, characterized by anxiety, uncertainty, fear, distrust and expressed in emotions, judgments and behavior. It has a dynamic characteristic, changing evolutionarily (sequentially, from less to more), or suddenly manifesting itself immediately in an acute form [7, p. 12–24].

Throughout modern history, it has been possible to notice how the value of certain types of resources has changed. For example, in the XIX century, Spain was involved in the Pacific Wars over the ownership of guano, which was used not only as fertilizer, but also as raw materials for the production of gunpowder and TNT [2]. Nowadays, the use of this resource has lost its economic importance.

In the era of industrialization of Western countries, control over iron ore and coal reserves was a prerequisite for industrial, military and political power Throughout the twentieth century, the growing consumption of natural resources by the powers caused their limitations. Since then, resources have continued to increase their role as a factor of international tension. For example, section p. Jordan between Israel, Jordan and Palestine caused international tension between them and led to a series of conflicts. In 1948 during the first Arab-Israeli war, Arab troops cut off the water supply in West Jerusalem. In 1951 Jordan has unveiled its irrigation plans in the Jordan River Valley. Israel responded by draining the Hula marshes located in the demilitarized zone between Israel and Syria. Because of this, Syria has repeatedly opened fire on workers, preventing drainage. In 1953, Israel began construction of the All-Israel Water Pipeline to divert water from the Jordan River to the southern regions of Israel. Jordan and Syria responded by organizing the construction of a dam to thwart the Israeli program. As a result, disagreements arose, which were the cause of the 1967 war, when Israel destroyed the constructed dam and occupied the Gaza Strip, the Golan Heights and the Jordan River bank, strengthening its position in the field of freshwater resources control [5, p. 38–40].

Another example is the development of the Euphrates’ water and energy potential by Turkey in the late 80s and early 90s, which caused discontent in Syria and Iraq. After all, the beginning of the construction of 7 dams on the Euphrates could deprive from 40% to 90% of the river flow. In 1990, their relations heated up to the limit when Turkey stopped the flow of the Euphrates to Syria for almost a month to fill the reservoir with one of the dams. This led to the drying up of an artificial lake in the area of Aleppo. This act was perceived by the neighbors as a deliberate deprivation of the waters of the Euphrates by the Arab countries. The Legal Commission of the League of Arab States (LAS) and the International Court of Justice reprimanded Turkey. The next example is the Greek-Turkish tension that arose in 1974 when it occupied the northern part of the island of Cyprus and recognized the Turkish Republic of Northern Cyprus there.

The current period of tension is caused by the actualization of the resource factor, when in 2011 an American geological exploration vessel discovered a new Aphrodite gas field in the Exclusive Economic Zone of Cyprus. Since that time, the Republic of Cyprus has been trying to defend the right to make its own decisions in the field of energy, while Turkey claims that the distribution of Cyprus' natural resources should be coordinated with the TRNC [3, p. 90–96]. Therefore, since the spring of 2019 Ankara has repeatedly sent its ships to Cypriot waters, which led to sanctions on the part of the EU [8, p. 442–464]. The prospects for reducing tensions between Turkey and Cyprus look unlikely, since this problem is closely linked to other hotbeds of tension in the Greater Mediterranean, which are characterized by growing trends today.

In addition to Cyprus, Turkey also remains tense in relations with Greece [9, p. 257]. It dates back to 1974, when Ankara invaded Nicosia. The reason was also the resource factor, manifested in three interrelated aspects: disagreements over the boundaries of Greek territorial waters and the ownership of some islands in the Aegean Sea; the issue of the exclusive economic zones of the two countries in the Eastern Mediterranean; as well as the Cyprus aspect [6, p. 8–11]. In 2019, the escalation of tensions reached unprecedented proportions among the 1974 military coup. Turkey stepped up drilling in the west of Cyprus. According to Greece, this violates its sovereignty, then, in December 2019 Ankara ratify an agreement with Libya, according to which an exclusive economic zone was created from the southern coast of Turkey to the northeast coast of Libya. Greece actively opposed it, noting that in this case the Greek island of Crete, located halfway between the two countries, is not taken into account [10]. As for the prospects of reducing the degree of tension, they seem difficult to achieve, since Greece supports the option of international arbitration in resolving disputes concerning natural resources, while Turkey prefers bilateral negotiations.

The data and many other examples confirm that the spatial distribution, volume, operating conditions and transportation routes of resources, especially energy, become crucial in the ability of States to pursue domestic, regional or international policies, and can directly affect the degree of international tension.

As a result of the study, we can conclude that resources are one of the main factors of international tension in the Greater Mediterranean region. Despite the hopes that natural gas, whose reserves have been striking in recent years, will bring peace and prosperity to the region, it has become a key factor in exacerbating the tension nodes that existed in the region earlier, as well as including new actors. Thus, the traditional sources of tension between Turkey, Greece and Cyprus have connected with a set of interrelated tensions and energy disputes in the Eastern Mediterranean between Turkey and a group of countries, including Israel, Libya, Egypt and the United Arab Emirates.

The growth of international tension caused by the resource factor in the last two years in the region poses a clear threat to regional stability. Interstate competition in the Greater Mediterranean has acquired a frankly geopolitical character, as economic partnerships caused by gas discoveries have turned into military-political alliances. In conditions of increased uncertainty and increased risk of conflict, the development of the region's resources continues to slow down. We can assume that a total military confrontation between the countries is unlikely, but "muscle play" and limited military clashes are quite likely.

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РОЛЬ ТАБАКА В ИСТОРИИ СРЕДНЕВЕКОВОЙ ЕВРОПЫ THE ROLE OF TOBACCO IN THE HISTORY OF MEDIEVAL EUROPE

Аннотация. В статье рассматривается вопрос использования табака в истории Средневековой Европы. Автором был проанализирован широкий спектр зарубежных источников по проблеме исследования. В европейском обществе XVI–XVII веков активно

популяризировалось курение табака, поскольку считалось, что данное вещество обладало полезными свойствами и даже использовалось для профилактики чумы. Тем не менее, в данный период также выявлено отрицательное отношение к табаку. Католическая церковь рассматривала курение табака как колдовство. В связи с этим люди, употребляющие табак, были отлучены от церкви. Английский король Яков I издал первый систематизированный труд, посвященный борьбе с распространением курения табака. Однако никакие меры не могли изменить того, что табак стал стратегическим сырьем, приносящим огромный доход от продаж. В связи с этим многие могущественные европейские державы боролись за право обладания табаком.

Abstract. The paper considers the role of tobacco in the history of Medieval Europe. The author analyzed a wide range of foreign literature sources revealing the aspects of the issue. As a result of the study, it was concluded that tobacco smoking was popularized actively in the European society of the XVI–XVII centuries. According to a number of publications, tobacco was supposed to have useful properties and it was even used to prevent the plague. Nevertheless, there were also opponents to tobacco. The Catholic Church regarded tobacco smoking as witchcraft. People who smoked tobacco were excommunicated from the church. The English King James I was the first to publish a systematic work aimed to stop the spread of tobacco smoking. Nevertheless, no measures could change the fact that tobacco would become a strategic raw material that brought huge revenue and profit. Thus, numerous powerful European countries compete for tobacco.

Ключевые слова: табак, курение, Средневековая Европа, плантация, коммерческий интерес.

Key words: tobacco, smoking, Medieval Europe, plantation, commercial interest.

Tobacco has influenced greatly the history of mankind. Today, about 1 billion people smoke without being aware of its origin and knowing where it came from. Why has it become so popular? Was it just an unfortunate misconception and by the time they figured out the truth about tobacco, millions of people had been already hooked? Or was it a huge business, too profitable to consider its health and moral hazards? And was it convenient to dress it up with supposedly beneficial medicinal usage?

A wide range of issues that still cause controversy among historians determines the relevance and significance of the chosen research topic. The analysis of new materials makes it possible to revise and update already known data from written historical sources.

The aim of this work is to consider the history of the origin and to outline the role of tobacco in Medieval Europe on the basis of historical sources and literature. So, the author studies the history of tobacco use in Medieval Europe.

The scientific significance of the work lies in the fact that this is the first attempt to systematize historical data on the appearance of tobacco and its role in Medieval Europe, referring to historical sources and modern literature.

After studying materials and historical publications, it was revealed that Europeans became acquainted with this plant for the first time only in the 15th century. In 1492, Christopher Columbus set foot on an “unknown” island. He was sure that he was in Asia. The sailor put on his best dress and went to meet with the locals. They handed him several dry leaves as a sign of friendship. It was tobacco. In Cuba, they first saw people smoking. It is reported that the “natives” had Y-shaped tubes. They inserted a double “mouthpiece” into their nostrils and inhaled smoke through their nose until they lost consciousness [2].

The first European countries to bring tobacco were Spain, Portugal and France. John Hawkins introduced smoking in England in 1565 [8]. He was a sailor, shipbuilder and slave trader. Having picked up a bad habit during one of the trips to the New World, he and members of his team returned to their homeland as heavy smokers. However, this phenomenon did not immediately spread

throughout Albion: for about 20 years, mainly sea wolves dabbled in tobacco. It was Sir Walter Raleigh, who actively promoted smoking in England. He was a courtier, a soldier, a sailor and a writer. Sir Walter became the favorite of Elizabeth I, winning her over with his charm, wit, as well as energy and ability to work. Raleigh was one of those who actively supported the idea of colonizing America. He equipped expeditions to the New World and raided Spanish ships. In 1580, he created the first tobacco plantation in Ireland, and later several more in the colonial American territories. So, he had a commercial interest in promoting tobacco smoking [5].

Undoubtedly, Walter Raleigh played an important role in the popularization of tobacco in England, but he also owns the authorship of many pipe accessories, as Eric Burns writes in his 2007 book “Smoke of the Gods,” devoted to the history of tobacco. Sir Raleigh's passion for pipe accessories famously went to the masses, and, as Eric writes, “*after a while noble and fashionable smokers were followed by a separate assistant who wore a huge number of all kinds of smoking accessories*” [1]. Thus, tobacco gained huge popularity in England. However, despite all his services to the crown, he was executed in 1618. Rising to the scaffold, Raleigh took a smoking pipe with him and, according to one version, held it in his teeth, when the executioner's ax fell on his neck.

As a clever businessman, Raleigh realized that to sell something new you need to turn it into a vogue, a fashion. Being one of the closest people to the Queen, he would be a trend setter for those who aspired to go up in the world. The fashion spread to the middle class, who always emulated the higher class, so, the mass consumption of tobacco started.

Tobacco became a popular English pastime, and most likely in Scotland too at the beginning of the 17th century. Originally, the Europeans considered tobacco a medicine. In 1560, Mr. Jean-Vilman Nico, who was then the Ambassador of France to Portugal, wrote a treatise on the healing properties of tobacco, calling it a “panacea”, “grass from all diseases” and “a plant that saves from all kinds of evils” [7]. It had a strong impact on the nobles, and as a result, snuff began to be used widely in all the royal houses of Europe. Jean Nico sent tobacco to his queen, Catherine de Medici, and recommended it as an excellent remedy for migraines. Due to Nico, the plant got subsequently the Latin name «nicotine». In 1571, the Seville doctor Nicolas Monardes also wrote an essay on tobacco, claiming that smoking eliminates any ailments [3]. In 1577, his work was translated into English by John Frampton, a businessman who once lived in Spain, but was forced to flee the country due to persecution by the Inquisition. European doctors showed great interest in the medical properties of tobacco. Then it was believed that tobacco smoke helps the anatomist or surgeon, who is engaged in autopsy, protect himself from dangerous miasms. Strange enough, but during the London plague epidemic in 1665, children in schools were told to smoke tobacco, which was considered a reliable remedy against miasms that carried the plague [6].

Nevertheless, there were also opponents to tobacco. The Catholic Church regarded tobacco smoking as witchcraft. The persons who smoked were expelled from the church. The Inquisition persecuted smokers actively. Among the doctors of that time there were those who questioned the medicinal properties of tobacco as well. The English King James I was an ardent opponent of tobacco smoking. Some researchers believe that his dislike of smoking was caused by a personal dislike of Sir Walter Raleigh. In addition, doctors complained to the monarch that people bought tobacco without a prescription, and demanded to take an action. As a result, the king wrote a critical treatise «A Counterblaste to Tobacco», in which he expressed his disgust for this product [4]. He increased the tobacco tax significantly in 1605 from 2 pence per pound to 6 shillings and 10 pence (i.e., 82 pence) per pound, an increase of more than 4,000%. Thus, the tax was about 35 pounds (or \$50) per pound (78 pounds per kilogram) compared to nowadays. In current UK tariff for “other smoking/self-rolling” tobacco is just under 104 pounds per kilogram. On the other hand, tobacco has become the part of the British life. The king feared that such a decision could cause discontent in society. The majority understood that potential value of this commodity, so some nobles convinced James I that tobacco was a highly profitable business, that could enrich the treasury.

Despite those doubts, tobacco continued to be in great demand, and pharmacies offered it to customers as a universal medicine in many European countries. Tobacco was profitable. The first English plantations were founded in Virginia and Ireland. Processed tobacco was delivered to large

English ports on ships. For example, in London on the banks of the Thames there were taverns where tobacco was sold actively, but only a rich person could afford to buy the product. In many developed countries of Europe, the first tobacco manufactories were established that were engaged in the processing of the product and selling it on the market. Thus, the research shows that tobacco became an important strategic raw material for which powerful countries fought, as it brought huge sales revenue. Its production has fundamentally changed the face of Europe. The role of tobacco in the history of Medieval Europe and its economic development requires further study. In this regard, this is the issue, which the author plans to focus on next.

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**ОСНОВНЫЕ ЭТАПЫ И ТЕНДЕНЦИИ РАЗВИТИЯ
МЕЖДУНАРОДНОЙ ТОРГОВЛИ
MAIN STAGES AND TRENDS IN THE DEVELOPMENT OF
INTERNATIONAL TRADE**

Аннотация. В статье подробно рассмотрен и проанализирован процесс эволюционного формирования и развития мирового рынка в целом, а также сферы международной торговли, в частности. Целью данной работы является выявление тенденций развития международной торговли и факторов, которые определяют ее перспективы. Актуальность исследования может быть обусловлена тем, что на данный момент экономика некоторых стран мира в большей степени ориентирована на внешнюю торговлю, зарубежные рынки, а также стратегической неопределённостью современного мирового развития, усилением социально-экономических противоречий. Развитие международной торговли не стоит на месте, это постоянно расширяющаяся и весьма динамично изменяющаяся сфера экономики, которая требует своевременного и постоянного анализа и мониторинга. Особое место занимают значения при исследовании данной темы официальные публикации международных организаций. При написании статьи использовались методы сравнительного анализа, синтеза и группировок.

Abstract. The article describes in detail and analyzes the process of evolutionary formation and development of the world market in general, as well as the sphere of international trade in particular. The purpose of this work was to identify trends in the development of international trade and the factors that determine its prospects. The relevance of the study of trends in the development of international trade may be due to the fact that at the moment the economy of some countries of the world is more focused on foreign trade, foreign markets, as well as the relevance can be characterized by the strategic uncertainty of modern world development, the strengthening of socio-economic contradictions. However, the development of international trade does not stand still; it is a constantly expanding and very dynamically changing sphere of the economy, which requires timely and constant analysis and monitoring. The official publications of international organizations occupy a special place in the study of this topic. When writing the article, methods of comparative analysis, synthesis, and grouping were used.

Ключевые слова: международная торговля, эволюция, экспорт, динамика, развитие.

Key words: international trade, evolution, export, dynamics, development.

The term international trade was used for the first time in the 12th century by the Italian economist Antonio Margaretti, the author of the economic treatise *The Power of the Popular Masses* in Northern Italy.

The start of the development of world trade and the formation of the world market is usually associated with the era of the great geographical discoveries in the 15th–16th centuries, which in turn contributed to the emergence of sea trade routes on a permanent basis between Europe and other continents. Previously, it seemed possible only overland communication between Europe and Asia on the one hand, and Africa, on the other, which was able to provide only a small amount of traffic, but the island countries of Asia and southern Africa, especially the American continent, were still

outside. Previous studies show that during the pre-Columbian era, Asia, especially China and India, played a large role in the development of trade, but had the opportunity to cooperate only with neighboring countries. From the point of view of economic development, this region was practically not inferior to feudal Europe, but in some ways even surpassed it.

In the 16th century, international trade was colonial in nature, that is, it mainly provided the delivery of raw materials and agricultural products (spices, tea, cotton, coffee), as well as exotic wonders and luxury goods from distant countries. Manufactured products, mainly fabrics, were returned from Europe to the colonies. Colonial possessions served as the basis for the expansion of international exchange.

At that time, the political and economic school of late mercantilism was developing in the European economy, the main point of which was the system of an active trade balance. At the same time, it was believed that the greater the positive difference between the value of exports and imports, the richer the country becomes. Therefore, European governments imposed restrictive rules on imports, imposing duties on foreign goods and stimulating exports, in particular by providing bonuses to manufacturers of products that were in demand on the foreign market. Representatives of late mercantilism no longer exalted wealth with gold and silver, but perceived it as a surplus that would soon turn into money in the foreign market. Money for them served not only as a means of accumulation, but also as a means of circulation, which cannot be said about the early mercantilists.

The real flourishing of international trade came later, with the first industrial revolution, the invention of the steam engine and the transition from manufactories to a factory system of production in the 17th century. The scale of foreign trade exchange increased significantly in connection with the expansion of the colonial system, the transformation of many countries of Asia, Africa and Latin America into agricultural appendages of developed countries, into the sphere of capital application, exploitation of cheap labor and, finally, into very capacious markets. radical changes in the sphere of economic relations. Industrial capital took the main place in society. National markets have emerged. The use of machines in production brought the division of labor beyond the national framework, and large-scale industry became largely dependent on international markets.

A new revolution in communications took place a little later. They began to build railways, replace sailing ships with steamships, all this contributed to the expansion of the possibilities and increased reliability of cargo transportation, which influenced the development of world economic exchange to draw in new continents and countries and develop new territories.

Technological progress, of course, contributed to the rapid development of international trade, but the development of capitalism was not an unimportant factor. Development first took place in Europe, and then, as it spread to other continents, in North America, Japan, South America and Australia.

Thanks to these two factors, the emergence of industrialization takes place, which contributed to an increase in technical equipment and labor productivity, the predominance of industrial production in the economy, and the growth of cities in large industrial centers. Industrialization influenced not only industry, but also other sectors of the national economy, primarily agriculture and transport, entailed progressive changes in the social division of labor. This caused a significant expansion of the domestic markets.

Another driving force behind the development of trade in general, and world trade in particular, was the powerful rise in the resource-extracting and manufacturing sectors of the economy, including the electric power industry, electrical engineering and the automotive industry, during the second industrial revolution of the first half of the 20th century.

In the second half of the 20th century, the main factors in the growth of production and trade were the new scientific and technological revolution, the transformation of the former colonies into independent states and international integration processes. Also influenced by the fact that these decades were free from world wars and devastating economic crises [1].

Over the five decades since 1950, the world's gross product has grown 6.9 times, and the volume of international trade – 18.6 times. In its entire history, the world economy has never experienced such rapid growth.

The beginning of the XXI century is characterized by the strategic uncertainty of modern world development, exacerbation of socio-economic contradictions. Therefore, it is important for business to take into account both trends in the development of international trade and geopolitical challenges.

Over the past 20 years, the export quota in world GDP has increased by more than 1.5 times. The data indicate a high level of economic interdependence among the countries of the world. International experts have established a positive correlation – the more firms and countries have access to imported resources, the more the economy integrates into international supply chains and the more exports grow.

Both developed and developing countries are active participants in international trade. In 2020, the top five exporting countries included China, the USA, Germany, Japan, the Netherlands, followed by South Korea, France, Hong Kong, Italy [2].

The study showed that over the past few years there have been no significant shifts in the development of international trade. According to WTO experts, global merchandise trade fell by even 0.1% in 2019, for the first time since the financial crisis of 2008–2009, driven by rising trade tensions and weakening economic growth, as well as weaker global GDP growth, which slowed down. up to 2.3% in 2019. World merchandise exports fell 3%. Global exports of commercial services increased by 2%, but the growth rate fell sharply by 9% compared to the figures recorded in 2018 [3].

International organizations attribute the slowdown in world trade growth primarily to the low level of economic activity in developed countries. Therefore, one of the key problems for the business of countries, in whose exports the share of manufacturing products prevails, in the coming years will be a slow growth in the volume of final consumption in developed countries.

The COVID-19 pandemic has led to an even more significant reduction in global trade in 2020. New export orders for manufacturing and services fell sharply in the first and second quarters of 2020, and the pandemic has had a strong negative impact on global trade in services as many of the largest service providers and consumers have imposed travel restrictions. One of the categories that may benefit from the pandemic is IT services, the demand for which has increased due to the increase in the number of people working from home [3].

The development of international trade in modern conditions is carried out under the influence of various complex and contradictory factors. Among them are:

- an increase in the complexity of the global supply chain (a modern end product is the result of the production of many enterprises from different countries of the world);
- development of economic and customs unions, providing for the absence of customs borders (that is, these forms of economic integration, in fact, presuppose complete economic liberalization within integration associations);
- the operation of international agreements, conventions and standards, such as the GATT / WTO package of agreements aimed at reducing customs tariffs and removing barriers to the movement of goods and services on the world market, conventions and standards of the World Customs Organization, ensuring the safety and facilitation of customs control, etc.

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**ВНЕШНЯЯ ПОЛИТИКА ФРАНЦИИ В РЕГИОНЕ БОЛЬШОГО
СРЕДИЗЕМНОМОРЬЯ В КОНЦЕ XX – НАЧАЛЕ XXI ВЕКОВ
FRENCH FOREIGN POLICY IN THE GREATER MEDITERRANEAN REGION IN
THE LATE XX – EARLY XXI CENTURIES**

Аннотация. Целью работы является демонстрация динамики формирования национальных интересов Французской республики в странах Большого Средиземноморья и её взаимодействия с ними в конце XX – начале XXI веков. В приведённых тезисах отображаются основные действия (поиск диалога со странами региона, создание специальных проектов и проведение конференций в сотрудничестве с другими европейскими странами) французского правительства в осуществлении своей внешней политики в рассматриваемом регионе и их последствия в период с 1995 по 2012 год. Результатом исследования выступает тот факт, что за почти 20 лет ведения внешней политики в странах Большого Средиземноморья Европе не удалось значительно изменить общеэкономическую и социальную ситуации к лучшему и поднять уровень жизни населения в нестабильном регионе.

Abstract. The purpose of the work is to demonstrate the dynamics of the formation of the French Republic national interests in the Greater Mediterranean countries and its interaction with them in the late XX – early XXI centuries. The main actions (searching for dialogue with the countries of the region, special projects and conferences held in cooperation with other European countries) of the French Government in the implementation of its foreign policy in the region and their consequences in the period from 1995 till 2012 are presented. The study provides evidence that for almost 20 years of conducting foreign policy in the Greater Mediterranean countries Europe has failed to significantly change the overall economic and social situation for the better and raise the standard of living of the population in an unstable region.

Ключевые слова: Франция, Большое Средиземноморье, внешняя политика, Барселонский процесс, Союз для Средиземноморья.

Key words: France, the Greater Mediterranean, foreign policy, the Barcelona process, the Union for the Mediterranean.

The macro-region of the Greater Mediterranean is a cross-border space where inter civilizational interactions and the spread of peoples, values and cultures have been occurred for centuries. All global political and economic processes are affected by crises (political, ethnoreligious, economic), local armed conflicts, which almost never stop there. The Mediterranean region has always been of strategic importance for France in three main aspects: the security of the southern borders of the French state, important economic cooperation and a common historical past that closely connects France with its Mediterranean neighbors [4].

The necessity of maintaining influence in the Mediterranean turned out to be one of the most urgent tasks for the French government when the colonial empires collapsed after the end of World War II. By the mid-50s of the XX century, important changes were taking place in France's foreign policy, as it needed to look for new ways of relations with the countries of the region. The French ruling class understood that one of the main ways to realize national interests was to develop a full-fledged Mediterranean policy towards the southern Mediterranean countries within the framework of a united Europe. A peaceful dialogue, based on a common community, culture and civilization had to be developed with these countries. At the end of the twentieth century a "special architecture of Mediterranean cooperation" was proposed by the French government within the EU. Thus, the Barcelona Process was implemented in 1995 and as its result was signed the declaration. It outlined the main directions of the Euro-Mediterranean partnership [1]. First of all, a partnership in the field of politics and security was established. In this area of cooperation, the partners put forward the goal of "establishing a common space of peace and stability". Then followed the partnership in the field of economics and finance. The need to "accelerate the rhythm of socio-economic development" in order to "improve the living conditions of the population and increase its employment level" was considered as specific tasks. Finally, the partnership in the social and cultural sphere was discussed. It was necessary to "develop human resources, promote intercultural understanding and exchange between societies" [3].

However, by 2005 the stagnation of this project became obvious. Therefore, before the election one of the French presidential candidates Nicolas Sarkozy proposed the idea of creating a Mediterranean Union that would unite the coastal countries of the Northern and Southern shores of the Mediterranean Sea. This union meant to be an organization capable of uniting Europe and Africa around the coastal Mediterranean countries and establishing a partnership based on equality between these countries [2]. French diplomacy hoped that the circle of countries interested in the development of the region would work out more effective cooperation schemes and implement them more successfully. After taking office as president in 2007, Sarkozy began to actively promote his idea, but a number of EU states, primarily Germany, opposed this initiative [1]. Nevertheless, the compromise was found and the negotiation process, which took place in several stages, ended with the adoption of a Declaration regulating the main activities of so called the Union for the Mediterranean.

The new Union's work was quite productive: many specialized conferences held; several major projects launched. But once again France had to change the methods of its foreign policy in the Greater Mediterranean region. The reason for this was the ongoing Arab-Israeli conflict, as well as the wave of Arab revolutions (2010–2011), which entailed significant geopolitical changes. The collapse of the political regime took place in three countries of the region. The exception was Tunisia, where the maintaining of the political stability happened to be possible. Following these events in the Mediterranean, destabilization has manifested itself in the Middle East. Major cities were captured in Iraq and Syria by a very unrelenting and religiously intolerant terrorist organization. And just like this a threatening situation developed very close to the southern borders of Europe. Then, in 2012, Nicolas Sarkozy, the author of the idea of creating a Union for the Mediterranean, lost the presidential election to Francois Hollande. The new French president preferred to pay more attention to internal political problems and those within Europe, rather than external affairs, since by that time the EU was in a situation of a prolonged decline in economic growth [1]. Hollande was not going to completely curtail the initiatives of his predecessor, but the priorities in foreign policy have shifted in some way. Therefore, with the departure of Sarkozy from the post of French President in 2012, the completion of a certain stage of France's foreign policy in the Greater Mediterranean region was obvious.

Thus, France is an integral part of the Greater Mediterranean region history and at the same time it largely determines its course. After the collapse of the French Colonial Empire, it was necessary to develop a full-fledged policy that would cover the sphere of economy, social relations, cultural and security issues in order to maintain French positions in this region's countries. The Barcelona Process, created in 1995, had contradictory results. The subsequent creation of the Union for the Mediterranean in 2007 led to the development and implementation of many major projects, but did not bring radical changes to Euro-Mediterranean cooperation. The global economic crisis played a certain role in this, forcing Europe to focus all efforts on solving its own problems. The Arab revolutions demonstrated that Europe's policy aimed at modernizing the socio-economic system of the countries of the unstable region failed in raising the living standard and solving other problems.

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**МЕТОДОЛОГИЯ ПОДДЕРЖКИ МАЛОГО И СРЕДНЕГО
ПРЕДПРИНИМАТЕЛЬСТВА В РЕСПУБЛИКЕ БЕЛАРУСЬ
METHODOLOGY FOR SUPPORTING SMALL AND MEDIUM-SIZED BUSINESSES IN
THE REPUBLIC OF BELARUS**

Аннотация. В рамках научно-исследовательской работы автором рассматривается методология поддержки малого и среднего предпринимательства в Республике Беларусь. Актуальность исследования обусловлена малоизученностью и недостаточной систематизацией институциональной системы поддержки предпринимательства в нашей стране. Результатом исследования и анализа стало выделение малого и среднего предпринимательства как немалозначительного субъекта общества, подверженного различным его изменениям, имеющего устойчивую, взаимозависимую связь с благополучием государства в целом, в возможности взаимодействовать и даже в определённой мере воздействовать на все звенья государственной цепи; также представлена авторская систематизация институциональной системы в Республике Беларусь, представленная в виде схем, имеющая важную практическую значимость по причине активной государственной политики нашего государства в области поддержки малого и среднего предпринимательства.

Abstract. As part of the research work, the author considers the methodology of supporting small and medium-sized businesses in the Republic of Belarus. The relevance of the study is due to the insufficient systematization of the institutional system of business support in our country. The result of the study and analysis was the identification of small and medium-sized businesses as a significant agent of society, which is susceptible to its various changes, having a stable, interdependent relationship with the well-being of the state as a whole, in its ability to interact and even to some extent influence all links of the state chain. The author's systematization of the institutional system in the Republic of Belarus is also presented in the form of schemes, which have an important practical significance due to the active policy of our state in the field of small and medium-sized businesses.

Ключевые слова: методология, малое и среднее предпринимательство, институциональная система, государственная поддержка, регулирование.

Key words: methodology, small and medium-sized business, institutional system, state support, regulation.

The most important role in the regulation of small and medium-sized businesses (hereinafter – SMBs) of the Republic of Belarus belongs to the state, in particular to laws, presidential decrees, government resolutions, many of which carry out not only indirect, but also direct regulation to a greater extent on factors affecting the foreign economic business environment.

A special role is played by the institutional system of support for small and medium-sized businesses (hereinafter – the institutional system), which the author considers especially relevant for studying due to the lack of its unified systematization in the context of the Republic of Belarus (in contrast, for example, in the Russian Federation this issue was considered by various researchers, such as Malacheva V., Lankin V., Tatarova A. and others), as well as of particular importance in the implementation of state policy in the field of SMB support [2].

The relevance of the study is related to the implementation in the Republic of Belarus of the State Program “Small and Medium-sized Business” for 2021–2025; as well as the need to systematize and generalize theoretical and methodological approaches to determining the essence of mechanisms for supporting small and medium-sized entrepreneurship in the Republic of Belarus.

The purpose of the study is to study the methodology of support mechanisms for small and medium-sized businesses, as well as to systematize information about the institutional system of SMB support in the Republic of Belarus.

Based on the research of the institutional system in Russia, the analysis of the normative legal acts of the Republic of Belarus on this topic, the institutional system of our country was divided into three *levels*: the main, additional and international (Figure 1).

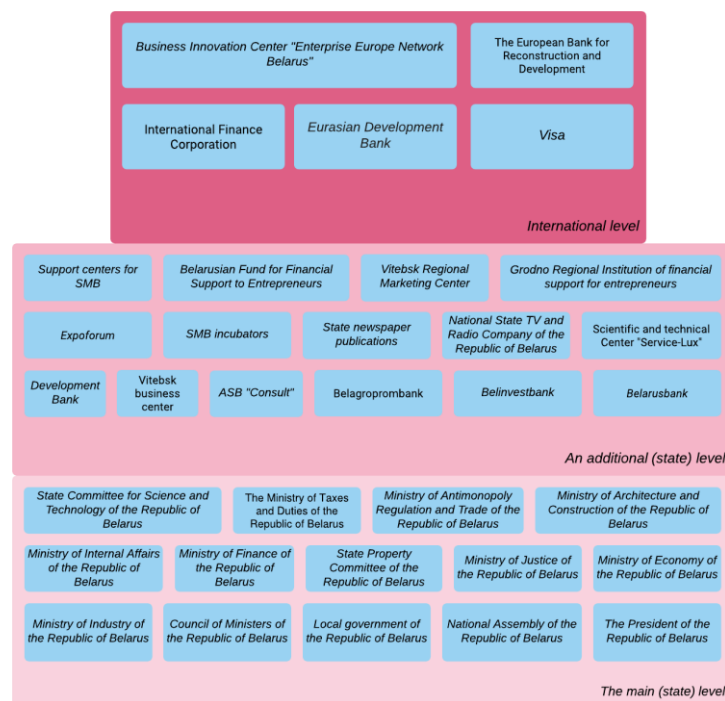


Figure 1. Institutional Support System for SMBs in Belarus

The main (state) level consists of elements of the state apparatus that are interested in the development of the country's SMBs. It is achieved through issuing regulatory legal acts, providing material and non-material support to small and medium-sized businesses, as well as monitoring each of other levels of the institutional system of SMB support. The system of interaction between the state and small or medium-sized businesses can be described in the form of a diagram (Figure 2).

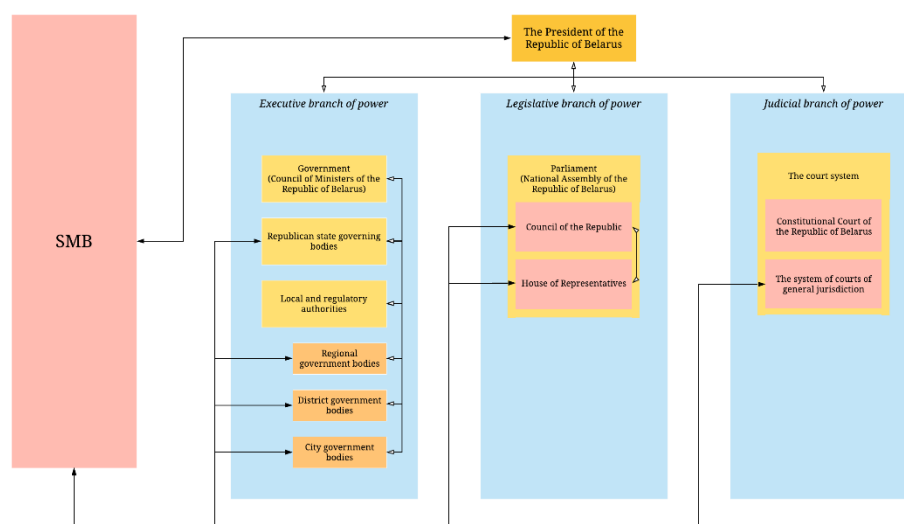


Figure 2. Interaction of SMBs with the state apparatus of Belarus

An additional (state) level consists of state organizations created directly for the purpose of small and medium-sized businesses improvement, and organizations which main shareholder is the state. For example, support centers and incubators for SMBs were established in accordance with the Law of the Republic of Belarus of July 1, 2010 “On Support of Small and Medium-Sized Businesses”, and are also guided by the principles laid down in the decrees of the President of the Republic of Belarus of May 21, 2009 No. 255 “On Certain Measures of State Support for Small Businesses” and No. 150 “On Certain Issues of Lease and Gratuitous Use of Property” dated March 29, 2012, as well as Resolution No. 1911 of the Council of Ministers of the Republic of Belarus dated December 30, 2010 “On Measures to Implement the Law of the Republic of Belarus”, “On Support of Small and Medium-Sized Businesses” [3]. Banks mainly provide financial support to small and medium-sized businesses. Organizations such as ASB “Consult” and STC “Service-Lux” provide audit, consulting and legal services, and Expoforum, Belteleradiocompany and newspaper publications open products of SMBs to a wide consumer [1].

The international level consists of organizations (mainly foreign and financial) that, in addition to allocating their funds, attract significant amounts of foreign direct investment, implementing a policy to create favorable conditions for entrepreneurial activity in the country.

It should be noted that non-state support for small and medium-sized businesses, apart from the international one, is practically not expressed.

Thus, the executive and legislative branches of government, as well as the President of the Republic of Belarus, have an impact on the development of small and medium-sized businesses. Having the ability to interact and even to a certain extent influence each of these links of the state chain, small and medium-sized entrepreneurship is not an insignificant subject of society, subject to its various changes, and at the same time an object that has a stable, interdependent relationship with the well-being of the state as a whole. In the future, this study can be expanded due to the active state policy of the Republic of Belarus in the field of SMBs.

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СОВРЕМЕННАЯ ДЕМОГРАФИЧЕСКАЯ СИТУАЦИЯ В КАЗАХСТАНЕ. THE CURRENT DEMOGRAPHIC SITUATION IN KAZAKHSTAN

Аннотация. В данной статье рассматривается одна из наиболее актуальных проблем Казахстана – демографическая ситуация. Указываются коэффициенты таких показателей, как смертность и рождаемость. Также рассматривается плотность, этнический состав и миграция населения. Приведены статистические данные, характеризующие компоненты роста численности населения.

Abstract. This article examines the current demographic situation in Kazakhstan which is one of the most actual problems in the country. The coefficients of such indicators as death rate and fertility are provided. Density, ethnicity and population migration are also considered. Statistical data characterizing the components of population growth is given.

Ключевые слова: население, плотность населения, естественное движение, этническая структура, миграция.

Key words: population, population density, natural movement, ethnic structure, migration.

As it is clear from practice, the demographic components of the development of countries and individual regions have a significant impact on all aspects of society: economic, social, political, ethnic, etc. Statistical methods of studying the population are one of the main methods in the study of demographic processes. The population of Kazakhstan has undergone a number of changes in different historical periods under the influence of various factors. The purpose of this article is to analyze the dynamics of demographic indicators of the population of Kazakhstan in the last intercensal periods.

The population of Kazakhstan had reached 19 million 62.7 thousand people by October 1, 2021 [1]. Kazakhstan is on the 64th place in the list of countries in terms of population. The average density is slightly less than 6.93 people per km² (Figure 1) (184th place in the list of countries in terms of population density).

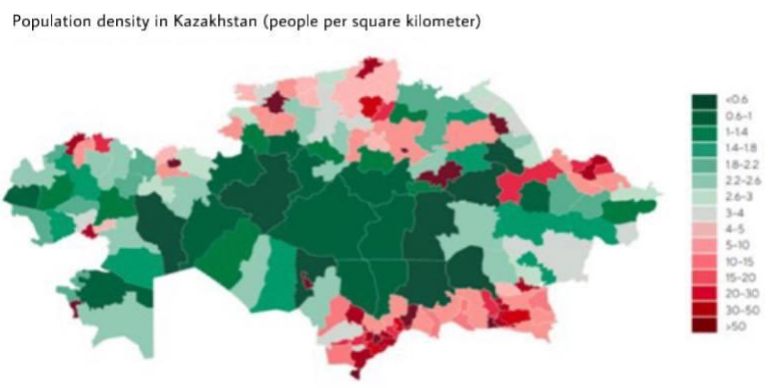


Figure 1. Density of the population of Kazakhstan

The population of the Republic of Kazakhstan was 16.4 million people at the beginning of 1991 [2], and by the beginning of 2000 it had decreased to 14.9 million people.

Kazakhstan is a multinational country where representatives of more than 100 ethnic groups and 18 confessions live. The republic occupies the ninth largest territory in the world, with an average population density of only 6.8 people per square kilometer. In the first decade of Kazakhstan's independence, the country's population was declining. From 1992 to 2001, it decreased by 1 million 600 thousand people, or 9.7%. Since 2002, the population of Kazakhstan has been growing steadily and by 2019, it had reached 18.4 million people. Sustainable growth is mainly associated with the cessation of significant migration loss of the population and an increase in natural population growth.

The increase in the population of the Republic of Kazakhstan was ensured by its natural growth (excess of the number of births over the number of deaths) over the past 20 years, which for the period 1999–2018 amounted to 3 million 628 thousand people. The decline in the population in 1999–2001 occurred as a result of migration losses that exceeded natural population growth. Migration growth took place only in 2004–2011, but during this period, the contribution of the excess of the number of births over the number of deaths to the total population growth was over 80%. Namely, the growth in the population was mainly due to natural growth. The increase in the population over the past 5 years would have been even greater (260–270 thousand people), if not for the increasing migration loss (from 0.3 thousand people in 2013 to 29.1 thousand in 2018). It accounted for 7.3% of the population growth between 2014 and 2018, and 10.8% in 2018 [1].

During the years of independence of Kazakhstan, the number and proportion of the population of the southern and western regions has significantly increased. In 1992–2018, the population of the Mangistau region almost doubled, the population of the Atyrau region increased by 46.4%, the Kyzylorda (by 34.1%) and Turkestan (by 33.3%) regions increased by about a third, by 22, 7% – Almaty and 17.5% – Aktobe regions. The share of the population of these regions in the total population of Kazakhstan increased from 42.2% to 47.7% from 1992 to 2019. At the same time, the regions located in the central, northern and eastern parts of the country suffered very significant population losses during this period. They are most significant in North Kazakhstan (39.6%), Akmola (31.0%) and Kostanay (29.6%) regions. The population of the East Kazakhstan region decreased by

22.4%, Pavlodar region – by 21.1%, Karaganda region – by 18.6%. The share of the population of these six regions in the total population of Kazakhstan decreased from 46.5% at the beginning of 1992 to 30.9% at the beginning of 2019 – by 1.5 times. Since 2008, the share of the urban population has been growing steadily. This growth is mainly due to the three cities of republican subordination. The combined share of these cities in the total population of the country was 11.1% at the beginning of 1992, reaching 21.4% at the beginning of 2019.

1. Nur-Sultan. Since 1992, the number of residents has increased 3.6 times – from 298,700 to 1,078,400 people at the beginning of 2019, respectively, the share of the population of the city of Nur-Sultan in the total population of Kazakhstan has tripled – from 1, 8% to 5.9%.

2. Shymkent. Since 1992, the population of the city of Shymkent has increased 2.5 times (from 400,500 at the beginning of 1992 to 1,009,100 people at the beginning of 2019), making up 5.5% of the total population of the country (having increased from 2.4 % in 1992).

3. Almaty. The population of the city of Almaty has increased since 1992 by 63.5%. Almaty remains the most populous city – 1,854,800 people at the beginning of 2019. The share of its population in the total population of Kazakhstan increased from 6.9% in 1992 to 10.1% at the beginning of 2019. The total urban population in Kazakhstan increased by the beginning of 2019 compared to the beginning of 1992 by 1 234 700 people, or by 13.6%, making up 58.2% of the total population of the country. The rural population predominates in the southern regions of the country – in the Turkestan region 80% of the rural population, in the Almaty region – 77.5%, in the Zhambyl region – 60.3% [5].

At the beginning of 2018, over 2/3 of the country's population were Kazakhs (67.47%), almost a fifth were Russians (19.76%). Among other nationalities, the most numerous are Uzbeks (3.18%), Ukrainians (1.53%), Uighurs (1.46%), Tatars (1.11%), Germans (0.99%). Differences in the parameters of population change, especially birth and death rates, the nature of migration processes determine the differences in the dynamics of the population of different nationalities and, consequently, changes in the ethnic structure of the population of Kazakhstan. The share of Kazakhs in the total population of Kazakhstan is significantly increasing. Its increase was especially significant in the period between the 1999 and 2009 population censuses (from 53.48% to 63.07%). After the 2009 census, it continued to grow and at the beginning of 2018 was 67.47%. The ethnic composition of the population varies significantly across regions and cities of Kazakhstan. The southwestern regions - Kyzylorda, Atyrau and Mangistau regions – are almost mono-ethnic, with the main predominance of the population of Kazakh nationality. A fraction of Kazakhs at the beginning of 2018 in them was more than 90% – respectively 96.2%, 92.4% and 90.7% (the second largest number of Russians in them – 1.9%, 5.4% and 5.7%). Higher than in Kazakhstan as a whole, the share of Kazakhs in Aktope (82.4%), Turkestan (76.3%), West Kazakhstan (75.9%), Zhambyl (72.6%) and Almaty (71.8 %) regions, as well as in Nur-Sultan (78.2%). The share of Russians in them (except for the Turkestan region) ranges from 10.0% in the Zhambyl region (the shares of Dungans (5.1%), Turks (3.0%) and Uzbeks (2.5%) to 19.6 % in West Kazakhstan. In the Turkestan region, there is a very significant share of Uzbeks (16.7%) and the smallest shares of Russians and Tajiks – 1.8% each. In Shymkent, the share of Kazakhs at the beginning of 2018 was 66.0%, Uzbeks – 18.2%, Russians – 9.7%. In the East Kazakhstan region, the share of Kazakhs is 60.0%, and Russians – 36.5%. There are almost the same number of Kazakhs in Almaty (59.5%).

Russians make up 26.1% here, and a significant proportion of Uyghurs (5.5%). Slightly more than half of the population are Kazakhs in Pavlodar (51.8%), Karaganda (51.3%) and Akmola (51.0%) regions. The share of Russians in them is 35.9%, 35.8% and 33.1%, respectively. In these regions, there is a significant share of Ukrainians (Akmola and Pavlodar – 4.4% each, Karaganda – 3.0%) and Germans (3.5%, 2.7% and 2.3%, respectively). In the northern part of the country – Kostanay and North Kazakhstan regions – Kazakhs make up less than half of the population (40.3% and 34.7%, respectively), and Russians are the most numerous (41.3% and 49.7%). There is a significant share of Ukrainians (Kostanay – 8.4%, North Kazakhstan – 4.2%) and Germans (3.1% and 3.5%, respectively) (Figure 2).

Ethnic structure of the population of the Republic of Kazakhstan according to the census of 1999 and 2009 and at the beginning of 2018 (%)

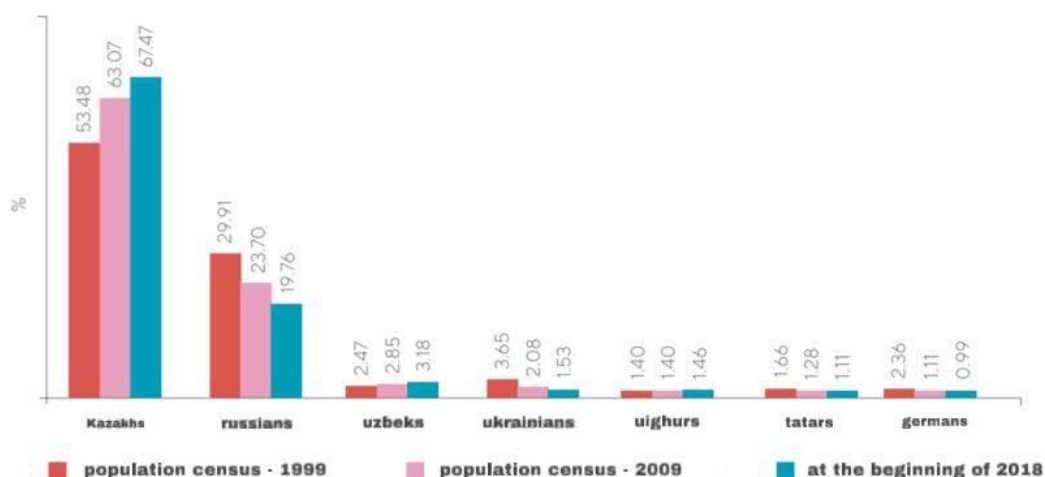


Figure 2. Ethnic structure of the population

There is a significant natural increase in the population in Kazakhstan. In 2014, 2015 and 2018, it exceeded 267 thousand people a year, the general rate of natural increase has stabilized in the range from 14.5 to 15.5 per 1000 population (Figure 3). Until 2017, the rate of natural growth of the rural population was higher than that of the urban population, and in recent years, the values of this indicator for the urban and rural population have become significantly closer. The value of this indicator differs significantly across regions and cities of Kazakhstan. The northern regions of the country are distinguished by the lowest values of natural growth, while its highest values are observed in the southern and western regions, as well as in Nur-Sultan and Shymkent, where the value of natural growth is significantly higher than the national average [1].

Dynamics of natural population growth in the Republic of Kazakhstan in 1991-2018

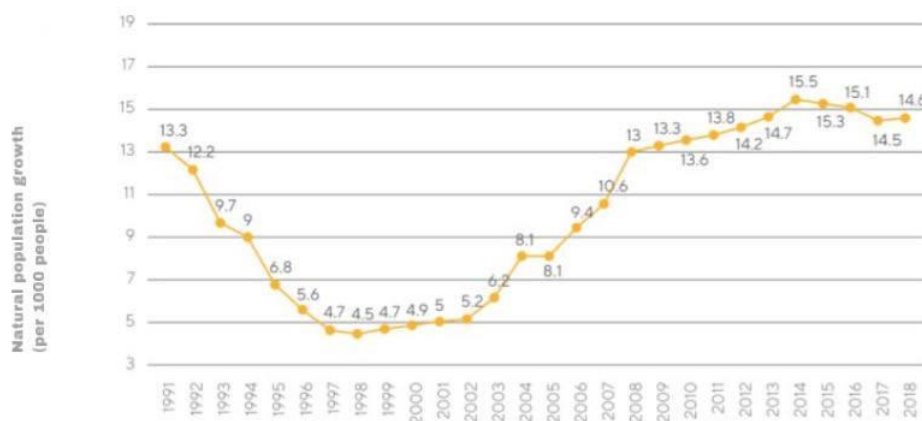


Figure 3. Dynamics of natural population growth

Throughout the history of the country, migration has influenced the development of the population of Kazakhstan. During the Soviet period, the republic received a large number of different categories of migrants. Among them were voluntary economic migrants who mastered virgin land, built, and then worked in mines and factories. More than half a million people arrived for the development of virgin lands. During the Great Patriotic War, the republic received a large number of forced migrants evacuated from the European part of the USSR. On January 1, 1942, 381,260 people arrived in the Kazakh SSR. According to some estimates, the total number of evacuees exceeded half a million people. Many of them stayed to live and work in Kazakhstan after the war.

Changing demographic processes is one of the key factors determining migration policy in the country (Figure 4).

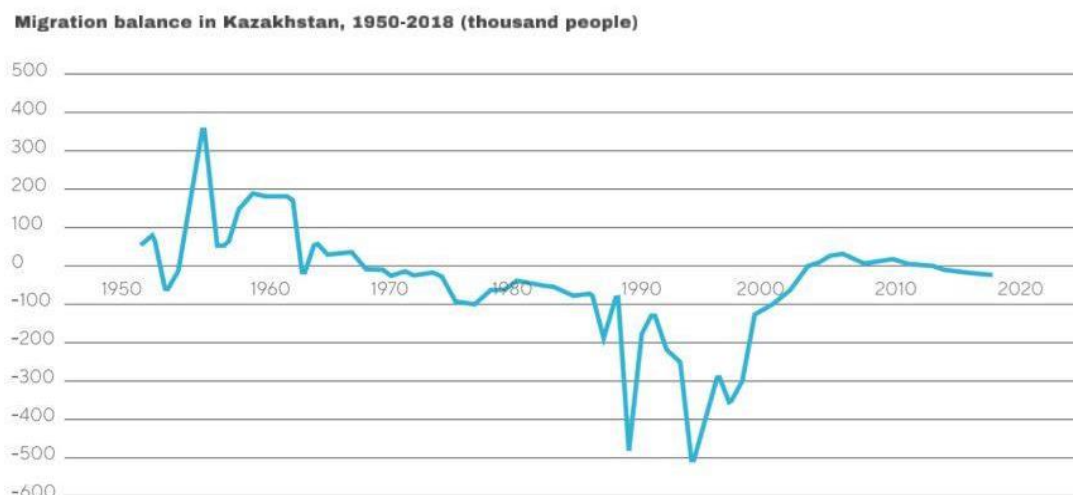


Figure 4. Balance of migration in Kazakhstan

The demographic situation in the regions of Kazakhstan is diverse and will develop in the future under the influence of the prevailing trends of natural reproduction and migration of the population. The current demographic trends will have a significant impact on the flows and directions of internal and external migration processes and will require their controlled adjustment in accordance with the planned development. Since 2000, the migration activity of the population within the country has been significantly increasing in Kazakhstan, the volume of interregional and regional migration of the population is growing as well [2].

In the Republic of Kazakhstan, on average, for 2000–2010, the number of interregional migrants amounted to 138,747 people. From 2010 to 2012, the value of this indicator increased by 18.8%. The annual growth of regional migration is 3.2%.

Internal migration in modern Kazakhstan has the following characteristics:

1. The main migration flow is directed to the cities of Nur-Sultan, Almaty, Shymkent and the western regions;
2. There are steady flows of migrants to prosperous/wealthy regions;
3. In the migration flow, the main share is occupied by the young population;
4. The key factor of migration flows is education and higher income.

Internal migration in Kazakhstan is characterized by intensive relocation of the economically active population from villages and ecologically disadvantaged regions to regions with a more favorable economic situation, thereby increasing the share of the able-bodied population in the host regions.

The population of the country as of February 1, 2021 amounted to 18 897.9 thousand people, including urban – 11 169.7 thousand people (59.1%), rural – 7 728.2 thousand people (40.9%). Compared to February 1, 2020 the population increased by 244.4 thousand people or 1.3% [Figure 5].

Natural population increase of the republic for the given period in comparison with January 2020 decreased by 821 people or 3.6% and amounted to 216.8 thousand people. Natural population increase rate amounted to 13.44 people per 1000 population.

As a result of processing the information contained in the CIVIL status provided by civil register offices, in January 2021 the number of births amounted to 34.2 thousand people, which is 0.6% less than in January 2020. Crude birth rate amounted to 21.17 births per 1000 population.

In the period under review the number of deaths amounted to 12.5 thousand people, which is 5.1% more than in January 2020. Crude death rate amounted to 7.73 births per 1000 population.

In January 2021, 241 (in January 2020 – 306) infant deaths under one year of age were registered in the republic. Compared to January 2020, the number of infant deaths decreased by 21.2%. Infant mortality rate amounted to 7.06 (8.90) per 1000 live births.

As a result of processing the information provided by migration authorities, in January 2021, 626 immigrants were registered in the country, which is less by 57.8% less over the corresponding period of 2020. Number of emigrants decreased by 43% and amounted to 1 535 people, net-migration -909 people.

The main migration exchange of the country takes place with the CIS countries. The share of immigrants and emigrants to and from CIS countries amounted to 81.9 and 84.8% respectively.

The number of internal migrants decreased by 19.1%. In terms of interregional migration, a positive net-migration was formed in 4 regions of the country: Mangystay oblast (90 people), Nur-Sultan (20202 people), Almaty (3 223 people) and Shymkent (3 030 people) cities [4].

To sum up, the following conclusions can be drawn:

- the positive dynamics of population growth is observed;
- there is an increase in natural population growth;
- the negative balance of migration in the 90s replaced the positive balance of the 2000s;
- the most densely populated regions are still the southern, southeastern and northern parts of the country;
- the largest cities of Kazakhstan are Almaty, Nur-Sultan and Shymkent.

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**СОВРЕМЕННЫЙ ВОСТОК: ОСНОВНЫЕ МОДЕЛИ И
ПЕРСПЕКТИВЫ РАЗВИТИЯ**
THE MODERN EAST: BASIC MODELS AND DEVELOPMENT PROSPECTS

Аннотация. В данной статье рассматриваются особенности и перспективы развития современных восточных стран, делается попытка поместить восточное разнообразие в какие-то общие рамки, и условно классифицировать современный Восток в соответствии с тремя основными моделями развития, учитывая его нынешнее состояние и потенциал. Дается краткая характеристика японской, индийской и африканской моделей развития. Японская «модель гармоничного синтеза» и индийская «модель симбиоза» показывают свою жизнеспособность и не требуют постоянной помощи извне. Африканская модель развития приводит страны к застою, кризисам и катастрофам. Выделяются группы стран, развитие которых не относится к определенной модели. Некоторые страны на Востоке, которые движутся к структурной перестройке, представляют собой сложную систему с сочетанием новых и старых структур, которые могут сосуществовать в течение длительного времени. Ведется поиск новой стратегии развития, которая может быть привязана к общему глобальному принципу, ориентированному на оптимизацию сельского хозяйства, способность гарантировать средства к существованию людей, а также использование всех возможностей под эгидой международных организаций.

Abstract. The article examines the characteristics and development prospects of the modern Oriental countries, attempts to place the Oriental diversity in some general framework and to conditionally classify the modern East according to three main models of development, taking into account its current state and future potential. The Japanese, Indian and African development models are briefly described. The Japanese model of harmonious synthesis and the Indian model of symbiosis show their viability and do not require constant assistance from the outside. The African model leads countries to stagnation, crises and disasters. There are groups of countries that do not belong to a particular model. Some countries in the east, which are moving towards structural adjustment, present a complex system with a combination of new and old structures that can co-exist for a long time. A new development strategy is being sought. It can be anchored in a common global principle that focuses on optimizing agriculture, guaranteeing people's livelihoods and exploiting all opportunities under the aegis of international organizations.

Ключевые слова: современные восточные страны, модели развития, синтез, симбиоз, Япония, Южная Корея, Тайвань, Индия, Турция, Пакистан, Египет, Африка.

Key words: modern eastern countries, development models, synthesis, symbiosis, Japan, South Korea, Taiwan, India, Turkey, Pakistan, Egypt, Africa.

When analyzing the general features and peculiarities of economic modernization in the eastern countries, it should be noted that these countries have made significant progress based on diversification and strengthening of economic relations by means of building an integrated domestic market space and developing its main components: commodity, industrial, financial and other markets. The countries of the Middle East and North Africa have deepened their links with the outside world through export industries, business, trade, tourism, etc. Their participation in the world market has increased, and they have become consistent with the objectives of modernization, the trend of globalization and internationalization of the world economy [8, p. 200].

Let us consider some models of their development.

The Japanese development model

The group of countries pertaining to this model includes the countries in the Far East, which in many fundamental respects clearly approximates the criteria of Euro-capitalism. Japan's political culture rejects the application of the majority principle as a violation of minority rights and is therefore characterized by complete and almost absolute control of the free market where competition between individual owners arises [7, p. 52].

The postwar Japanese state began to ensure the efficient functioning of the economy while preserving all other functions necessary for normal development. Japan ceased to be a traditional state and became more Euro-capitalist than Western European countries and the United States. This applies not only to the state but also to other elements of the Euro-capitalist structure, such as democracy, laws and many other standards [2, p. 722].

However, it is characteristic that Japan has not ceased to be Japan even though it has left the advanced European countries behind in many respects. It has not lost its face and remains an oriental country. It is sufficient to mention the existence of work discipline and the absence of strikes as well as the successful cooperation between employees and management (Confucian norms are rooted both in the socio-psychological and in institutional aspects). All in all, Japan is a compelling example of a harmonious, very successful in many respects, almost optimal synthesis.

Following the example of Japan, other countries are doing the same. Their peculiarity is the predominance of market relations, and the involvement of a large part of the population in the sphere of such relations. A striking example of this process is South Korea, which was reborn as a democratic state. Like Taiwan, the eastern autocratic state went to great lengths to help transform its traditional power structure and reorient its people towards an existence in a market economy.

The Indian development model

This model significantly differs from the one described above in its internal heterogeneity. It refers to a large group of countries that have succeeded in developing along the path of Euro-capitalism but have not yet rebuilt their traditional internal structures. In fact, a large part of the population (predominantly urban dwellers) already exists in a newly transformed capitalist economy while the majority is only marginally affected by innovation and change. These two parts are in active contact with each other, but at the same time they are also separated, each of them living according to its own laws. But they constitute a single "organism". This is the phenomenon of symbiosis the essence of which lies in the fact that there remains an invisible but solid boundary between those who have crossed the barriers of tradition and those who have not crossed them yet. Such boundaries existed everywhere, including the countries following the first model. But they were overcome relatively quickly and disappeared. The reasons for this are deeply rooted in the traditions, religious patterns and civilized foundations. It takes time and favorable conditions to get rid of these boundaries.

The economic future of these countries depends on their internal solidity that is ensured by the fact that their current polity is based not only on constitutional provisions but also on tradition. The most typical example is India where there is a system of communities and castes that bind the majority of the population, and the current polity is based both on constitutional provisions and on tradition [3, p. 88].

Many Southeast Asian countries, from Thailand to Indonesia, and many Islamic countries, such as Turkey, Pakistan and Egypt, can also be included in this model. The monarchical group of

Arab oil-producing countries can be considered as a variant of the model presented. It adjoins the countries of this group but differs in several important respects. Here there is also a symbiosis in which each state has two sectors of economy and two parts of the population, sharply and visibly different, coexist together. However, unlike the countries in the first group, there are few institutional elements of the European structure here, and there is no visible indication that the majority of the local population and part of the customary bodies of authority at its head are moving towards the standards of Euro-capitalism. What the countries have in common is that in principle they are in a state of equilibrium or sustainable stability. Even if not prosperous, their economy can at least sustain the country's existence. The countries developing according to this model do not need regular aid, and they also have prospects for economic growth. In many countries of this type, there is a tendency to overcome the situation of symbiosis, to get out of it and move towards synthesis.

The African development model

Countries falling into this model are characterized by underdevelopment and crisis. Countries in this model include most African countries, some countries of the Islamic world, such as Afghanistan and Bangladesh, and poor countries in Asia such as Laos, Cambodia and Burma. They are characterized by a low level of basic development, the absence or weakness of the existing religious and civilizational foundations, the lack of natural resources bringing as much profit as oil does, underdeveloped commodity-money relations, low entrepreneurial culture and the lack of domestic incentives to develop and modernize market production [4, p. 36].

The only way to solve this problem is to consciously pursue large-scale development policies aimed at integrating local populations. With the support of the United Nations, its specialized agencies and other organizations, many funds and programs have been set up to promote the development of underdeveloped countries, mainly in Africa. This requires reducing military expenditure and allocating part of its funds to support underdeveloped countries. Given the current progress in international relations, it seems realistic.

The development models described above are not applicable to all modern Eastern countries. First of all, this applies to such countries as China and Vietnam, which are actively working on structural reforms, and also North Korea. A distinctive feature of their development model is active participation of the state in the development of the economy, export orientation of the economy, use of cheap labor, attraction of foreign investment, active import of technology, etc. [3, p. 87]. Formally, the Chinese (and Vietnamese) leadership has always emphasized the desire to build socialism. The problem is the provision of social guarantees, restrictions on the functioning of markets and private property, which have traditionally been controlled by the Eastern states. If so, China may soon join the Indian model and become another development option in this model.

The modern East is an aggregation of countries developing according to different models. Japan's harmonious synthesis model and India's symbiosis model are viable and do not require constant external support. The African model of development is unsustainable. Development under this model leads to stagnation, crises and disasters. The same could be said about Asia's poorest countries. Sufficient aid has been provided to these countries, but due to growing populations, increasing debts, lack of development strategies, the problems remain and are getting worse every year. Therefore, the search for ways and methods to further advance the modernization process, which would qualitatively reduce the rather high level of political, socio-economic, ethnic, religious, inter-tribal contradictions, is of great importance.

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ФОРМИРОВАНИЕ ИННОВАЦИОННОЙ СИСТЕМЫ ГОРОДА СЕВАСТОПОЛЬ FORMATION OF THE INNOVATION SYSTEM OF THE CITY OF SEVASTOPOL

Аннотация. В данной статье рассматриваются вопросы, связанные с формированием инновационной системы города Севастополь, при которых учитываются происходящие процессы определения места данного региона в системе территориального разделения труда и налаживания экономической кооперации с другими регионами Российской Федерации. Целью является изучение формирования инновационной системы в городе Севастополь на основании анализа инновационной деятельности в данном регионе с учетом факторов влияния. Основные методологические принципы, лежащие в основе исследования, базируются на фундаментальных положениях российских и зарубежных специалистов в области экономики и инновационной деятельности, также в данном исследовании используются такие методы, как: анализ, сбор данных, сравнение, а также дедукция. Проведенный сравнительный анализ научно-технической и инновационной деятельности города Севастополь позволяет выявить такие факторы, которые влияют на формирование и развитие инновационной системы в данном регионе, а также позволяют наглядно отразить ее суть.

Abstract. This article discusses issues related to the development of innovation system in the city of Sevastopol, which takes into account the ongoing processes of determining the place of this region in the system of territorial labor division and establishing economic cooperation with their regions of the Russian Federation. The aim of this article is to study the development of innovation system in the city of Sevastopol based on the innovation activity analysis, taking into account the influence factors. The main methodological principles underlying the research are based on the fundamental positions of Russian and foreign experts in the field of economics and innovation. Analysis, data collection, comparison, and deduction are the basic methods used in this study. The comparative analysis of the scientific, technical and innovative activities of the city of Sevastopol allows identifying factors affecting the development of innovation system in this region, and reflecting its essence.

Ключевые слова: формирование инновационной системы, регион, развитие экономической деятельности, исследования, разработки.

Key words: innovation system formation, region, economic activity development, research, development.

In the context of globalization and international competition, the innovative option for the development of the Russian economy has virtually no alternative. The innovation system formation is an integral part of the development strategies of all Russian regions. Currently, innovative activity is the most important competitive advantage of the region, as it forms and contributes to the growth of socio-economic development. Therefore, the relevance of the topic is due to the fact that in the modern period, the successful socio-economic development of both the country as a whole and the regions that are constituent parts of the country is possible only on the basis of the formation and development of innovative systems in the regions.

It is worth noting that the innovation system formation in the Russian institutional conditions and legal framework for a region such as the city of Sevastopol is poorly studied. In this region, in 2014, the economic conditions related to the change in the legal field, as well as the methods of collecting and processing statistical data, federal and regional state programs began to operate.

Moreover, when considering and analyzing data related to the innovation system formation in the city of Sevastopol, it is necessary to take into account the ongoing processes of determining the place of this region in the system of territorial division of labor and establishing economic cooperation with other regions of the Russian Federation. Innovative activity in this sense is declining due to the effect of international sanctions and restrictions imposed in 2014 being in force up till now.

The purpose of this study is to explore the innovation system formation in the city of Sevastopol based on the analysis of innovation activity in this region, taking into account the factors of influence.

The topics related to the innovation system formation in various regions are considered on an ongoing basis by various scientists. Buresh O.V. and Lapaev S.P. [3] analyze the functions of the regional innovation system and the factors of its development. They highlighted its main elements and sectoral features. Doroshenko Yu.A. and Berezhnaya A.V. [5] present the main methodological approaches to the regional complex investment and innovation system formation, designed to accumulate existing resources of investment and innovation potential for their further involvement in the innovation process. Dadalko S.N. and Vostrokrylova I.P. [4] analyze the results of the national innovation system (NIS) of a particular region, and the authors also suggest possible ways to activate the subjects of NIS and its integration into the knowledge economy of the system. It is also worth noting the publication of Piskun E.I., Simchenko N.A. and Tarasenko S.V. [8]. They study socio-economic development of the city of Sevastopol as well as the enterprises involving innovative technologies.

Ayvazyan S.A., Afanasyev M.Yu., Kudrov A.V. and Lysenkova M.A. [1] have established a relationship between the results of innovative activity in the region and the number of potential connections between scientific organizations and business companies. Despite extensive research in the field of innovation, there is a need for further study of these issues in specific regions, especially in the new subjects of the Russian Federation.

The main methodological principles underlying the research are based on the fundamental positions of Russian and foreign specialists in the field of economics and innovation. Methods such as analysis, data collection, comparison, and deduction are widely used in the study. Economic calculations in this article are carried out on the basis of the Federal State Statistics Service (ROSSTAT). This service is a federal executive authority that performs the functions of collecting official statistical information on social, economic, demographic, environmental and other social processes in the Russian Federation, as well as in the manner and cases established by the legislation of the Russian Federation on control in the field of official statistical accounting [7]. The author's statistical study is based on data for the Russian Federation, the Southern Federal District, the Republic of Crimea, as well as for the city of Sevastopol.

Innovations are understood as the final result of the development (fundamental and applied research) and commercialization (bringing the development to the stage of a finished product capable of making a profit) of a new idea that is transformed into a new or improved product, technology, organizational or marketing solution [6, p. 70]. However, the difference between the concepts of “innovation”, “novation” and “introduction” should be born in mind. According to Belyaev Yu.M., innovation is a formalization of fundamental and applied research result in any field of activity that increases its effectiveness. The innovation is meant a material object that did not exist before, that is, Belyaev Yu.M. defines “innovation” and “introduction” as the final result of the innovations implementation in order to change the management objects and obtain an economic, social, scientific, technical or other type of effect [2, p. 15].

An important concept is an innovative system. The “Strategy of innovative development of the Russian Federation for the period up to 2030” gives a fairly complete definition of this term: an innovation system is a set of subjects and objects of innovative activity interacting in the process of creating and selling innovative products and carrying out their activities within the framework of the state policy in the field of innovation system development [7].

First of all, we will analyze the statistical data on scientific research, as they provide the basis for future innovations.

Table 1 shows the internal costs of enterprises and organizations in Sevastopol, the Republic of Crimea and the Russian Federation as a whole for research and development for the period 2017–2020 [9].

Table 1. Internal current costs for research and development in the subjects of the Russian Federation, million rubles

Region	Total			
	2017	2018	2019	2020
Russian Federation	873778.7	950257	960689.4	1060589.7
Southern Federal District	24956.5	24277.6	25076.7	27085.7
Republic of Crimea	1275.3	1393.5	1415.5	1401
Sevastopol	623.8	786.8	797.8	1008.8

In total, in the Russian Federation, the costs of organizations for research and development in 2020 amounted to 1.06 trillion rubles. The costs of organizations that carried out research and development of the Southern Federal District in 2020 amount to about 2.6% of the all-Russian indicator or 27.1 billion rubles, and its share for the period 2015–2020 increased by 2.1 billion rubles. Sevastopol organizations have allocated 1.008 trillion rubles for research and development, or

0.00095 percent of the all-Russian indicator, which is very different from the national average. Internal current costs for research and development in the Russian Federation as a whole, as well as in the Southern Federal District, the Republic of Crimea and Sevastopol tend to increase. In dynamics, the share of expenses of organizations in Sevastopol in the total budget of funds for research and development increased 0.0007 to 0.0009 per cent, however, in general, the amount of costs is lower than the average Russian indicators.

In order for innovation to appear, not only a significant scientific and technical potential is needed, but there must be a demand for scientific developments. Therefore, it is necessary to analyze the processes of introducing new ideas, scientific developments into production, that is, directly innovative activities of enterprises and organizations. To characterize the processes of commercialization of innovations, it is necessary to use statistics on the developed and used advanced production technologies, which are presented in Table 2 [9].

Table 2. Developed and used advanced production technologies by subjects of the Russian Federation, units

Developed and used advanced production technologies					
Region	2016	2017	2018	2019	2020
Russian Federation	1398	1534	1402	1565	1620
Southern Federal District	63	76	79	113	145
Republic of Crimea	-	-	-	-	-
Sevastopol	-	-	-	-	5
Advanced manufacturing technologies used					
Region	2016	2017	2018	2019	2020
Russian Federation	218 018	232 388	240 054	254 927	262645
Southern Federal District	10 850	12 308	13 264	14 037	15660
Republic of Crimea	75	102	86	85	108
Sevastopol	108	316	224	221	540

In 2020, 1620 advanced production technologies were developed in the Russian Federation, the dynamics for 5 years is positive, the average annual growth rate for 5 years in the Russian Federation was 2.25%. In the Southern Federal District, the number of advanced developments has doubled in 5 years. For Crimea and Sevastopol, due to institutional changes and problems in the collection of statistical data during the transition period (2014–2017), it is difficult to trace the dynamics, and data for 2018 are not published in order to ensure the confidentiality of primary statistical data received from organizations. Data for 2016–2020 show that the number of advanced production developments was 5 in the city of Sevastopol.

In general, 262645 advanced technologies were used in the Russian Federation in 2019. At the same time, over the five-year period 2016–2020, the growth rate was +20.5%, in the Southern Federal District +44.3% (15660 technologies in 2020), in the Republic of Crimea +44% (108 technologies in 2020), for Sevastopol the number of technologies increased 4 times (540 technologies in 2020).

It is also necessary to present the costs of technological innovations of organizations for the period 2018–2020, by subjects of the Russian Federation, million rubles (Table 3) [9].

Table 3. Costs of technological innovations of organizations in 2020 by subjects of the Russian Federation, million rubles

Region	2018	2019	2020
Russian Federation	1284590.3	1404985.3	1472822.3
Southern Federal District	66255.6	82662.6	41125.4
Republic of Crimea	615.2	620.8	602.1
Sevastopol	51.5	45.9	83.3

In the Russian Federation in 2020, the costs of technological innovations of organizations amounted to 1472822.3 rubles, while the growth rate for the three-year period 2018–2020 was +14.7%, in the Southern Federal District – 37.9%, in the Republic of Crimea – 2.1%, which indicates a negative trend in the costs of organizations, as for Sevastopol, the number of costs increased for it and the growth rate was 61.7%, but it is worth noting that in terms of the cost of organizations for technological innovations, Sevastopol, similar to the level of innovative activity of organizations, is significantly inferior to other regions.

Thus, the comparative analysis of scientific, technical and innovative activities in the Russian Federation, in the Southern Federal District, the Republic of Crimea and Sevastopol allows us to identify such factors that affect the formation and development of the innovation system in the region, and also allow us to clearly reflect its essence:

- internal running costs for research and development;
- developed advanced production technologies;
- advanced manufacturing technologies used;
- costs of technological innovations of organizations.

Availability of a reserve of financial and logistical resources, advanced technologies, necessary economic and scientific and technical infrastructure and state support for innovation (including preferential legislative measures) contribute to the development of innovative activities of the city of Sevastopol. It is also worth noting that the lack of funds to finance innovative projects, the weakness of the material and scientific and technical base, the lack of reserve capacities have a negative impact on the formation of the innovation system of the city of Sevastopol and any other region of the Russian Federation as a whole.

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**ГЛОБАЛЬНЫЕ УСЛОВИЯ И ТЕНДЕНЦИИ В РАЗВИТИИ
ТОРГОВОГО СУДОХОДСТВА В СОВРЕМЕННОМ МИРЕ
GLOBAL PREREQUISITES AND TRENDS IN THE DEVELOPMENT OF
MERCHANT SHIPPING IN THE MODERN WORLD**

Аннотация. В тезисах отражены общие положения исследования основных направлений развития торгового судоходства в современном мире. Автор объясняет основные условия развития рынка услуг морским транспортом и его влияние на направления в выборе путей развития торгового судоходства. Формирование единой мировой экономики, ее монополизация и конкуренция совместно с изменением климатических условий являются основными факторами, влияющие на выбор векторов в развитии морского сектора экономики, а именно строительство новых судов с учётом развития цифровых, информационных и инновационных технологий в судостроении и портовой инфраструктуре.

Abstract. The work reflects the general provisions of the study of the main directions of the development of merchant shipping in the modern world. The author explains the main conditions for the development of the market of services by sea transport and its influence on the directions in the choice of ways to develop commercial shipping. The formation of a unified world economy, its monopolization, and competition, together with changes in climatic conditions, are the main factors influencing the choice of vectors in the development of the maritime sector of the economy, namely the construction of new ships taking into account the development of digital, information and innovative technologies in shipbuilding and port infrastructure.

Ключевые слова: глобальные условия, направления развития, торговое судоходство, современный мир, конкуренция, стратегии развития.

Key words: global conditions, directions of development, commercial shipping, modern world, competition, development strategies.

The main conditions in the development of the global economy in the 21st century are the rapid development of information and communication technologies, international markets for finance and goods, the creation of world financial companies and a network of trade routes. The creation of new international legal relations for the free movement of goods and financial flows leads to the global development of the modern world, to a fundamental change in the world order, which is reflected in the loss of the original meaning of national borders caused by the development and diktat of mass culture.

As a result of the globalization of the economy, a single world networked market economy and its infrastructure are being formed, the influence of state sovereignty, which has been the main actor in international relations for many centuries, is decreasing. The process of globalization is a consequence of the evolution of state-formed market systems.

Global changes affect all sectors of production, services, science and education. Logistics with the use of sea transport is of particular importance for the development of markets for goods. Dramatic changes driven by trends such as digitalisation, e-commerce expansion and the Belt and Road Initiative can further boost global shipping.

The factors of tension in trade caused a change in the existing picture of transportation, since as a result of the search for alternative markets and suppliers, there was a reorientation of cargo flows from China to other markets, especially in the countries of Southeast Asia [2, p. 4]. As a result of the globalization of the world economy, a further process is observed consolidation in the form of mergers and acquisitions, restructuring of global alliances, in particular in liner shipping. By reducing the number of carriers in the market, individual carriers have expanded their transport networks to cover more countries. This state of affairs leads to fierce competition in the field of maritime transport.

Competition is observed not only between the participants in the maritime transport, but also the entire infrastructure of the maritime industry, including ports and terminals and shipyards. Due to the increase in the size of ships, the construction of multipurpose vessels and the emergence of mega alliances, the requirements for adapting port infrastructure have increased. Together, these trends have led to increased competition between ports striving to become ports of call for ships of alliances of shipping companies, whose decisions on the distribution of ships, the choice of ports of call and the organization of the transportation network may depend on the fate of the terminals. As a result of the increase in the carrying capacity of ships, large ports have better efficiency and involvement in the transportation system than ports with a limited line of cargo terminals.

In shipbuilding, corporations and companies gain a competitive advantage by reducing operating costs by relocating production overseas, buying raw materials cheaper by lowering or eliminating customs tariffs, and gaining access to cheap labor. In this area, development is possible with government support in the purchase of technology and equipment, concessional lending to production, subsidizing research and development work, and encouraging structural reforms in the industry.

Competition changes its form, moves from pure competition, where the price is formed under the influence of supply and demand, to monopolistic or dishonest competition.

The transport development strategy is an opportunity to stimulate the economy, solve the problems of poverty and climate change. Thus, in the EU transport strategy until 2050, it is planned to ensure a zero level of harmful emissions for almost all vehicles [3, p. 3]. Climate change on the planet also affects the development of merchant shipping. Once considered one of the safest modes of transport in terms of emissions, shipping is now seen as a growing threat in the battle to tackle climate change. The issue of greenhouse gas emissions from international shipping continues to figure prominently on the international agenda. IMO has made progress in meeting the ambitious targets set in its original strategy to reduce greenhouse gas emissions from ships. These include the energy efficiency of ships, alternative fuels and the development of national action plans to reduce greenhouse gas emissions from international shipping [2, p. 7]. It is expected that the public pressure on shipowners will increase to switch to the best grades of fuel with a low sulfur content or to “green” technologies in shipbuilding: the use of alternative types of marine fuels, the organization of ballast

water management measures, measures to combat biofouling, reducing pollution from plastic waste and microplastics.

The coronavirus disease (COVID-19) pandemic has clearly demonstrated the global interdependence of states and has served as an impetus for the development of new trends that will change the face of maritime transport [2, p. 3].

Ship features such as gas and electric engines, new hull designs, no ballast ships, more energy efficient materials and “cleaner engines” are increasingly in demand among shipowners. Shipyards are also involved, investing in the skills, technology and processes required to build such ships. Shipyards are also increasingly focusing on “green logistics” that reduce waste and pollution throughout the entire production and supply chain.

Global trends in the development of the maritime industry until 2030 will develop under the pressure of a transition to renewable energy sources and a reduction in environmental pollution. In a pandemic, the status quo will obviously remain, due to a decrease in the demand for resources and goods. After a period of stagnation, the maritime industry will develop in the context of either a global community or competing countries. The shape of the marine world will depend on the interaction between people, economy and natural resources [4].

Currently, the vectors of intensive implementation of innovations and new technologies in the development of shipping are:

- at the stage of design and construction of ships – the use of automated design systems using databases of regulatory support for the development of design and technological documentation, three-dimensional modeling, which increase the quality and terms of implementation of design, working and technological documentation;

- in the field of machinery and equipment – the use of robotics, information sensors, computer systems capable of analyzing large databases, propulsion systems using composite materials;

- in the field of loading and unloading operations – the use of loading and unloading equipment with built-in sensor sensors displayed on the computer display, as well as the use of equipment controlled remotely using radio communications;

- navigation and communication – the transition to the use of e-navigation to solve the problems of improving the safety of navigation using Internet technologies that meet the needs of users through the coordination of marine navigation systems and coastal support services;

- Intelligent ships that apply the latest information technologies, including real-time data collection and processing, high-capacity computing, digital simulation and remote control. Also, a set of information systems will be built into the software of such ships, capable of monitoring the condition of the main equipment, such as engines and ship mechanisms. All this reduces the workload on the crew and increases the efficiency of the bulk carrier.

Despite the desire of society to create a single market for goods and services, where the distribution of profits could be fair among all its participants, competition as a model of a modern market with the functions of allocating resources to those industries and activities for products and services of which there is a demand, stimulation the introduction of the achievements of science and technology, the release of new types of products and services, new technologies, improving the quality of products, distributing income and profits among the most successful enterprises and monopolization will have a primary impact on the development of merchant shipping in the modern world.

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РИСКИ И ПРЕИМУЩЕСТВА СУРРОГАТНОГО МАТЕРИНСТВА CHALLENGES AND BENEFITS OF SURROGATE MOTHERHOOD

Аннотация. В статье поднимаются вопросы, связанные с суррогатным материнством – одной из доступных в настоящее время форм вспомогательных репродуктивных технологий для пар, которые не могут самостоятельно зачать ребенка. Цель статьи состоит в том, чтобы рассмотреть риски и преимущества суррогатного материнства. Изучение суррогатного материнства представляет значительный интерес, поскольку противоречит нормам создания семьи. Выделены правовая база суррогатного материнства, а также требования к суррогатной матери.

Abstract. The article provides an overview of surrogate motherhood – one of many currently available forms of Assisted Reproductive Technologies for couples who find themselves unable to conceive a child on their own. The aim is to address the challenges and benefits involved in surrogate motherhood. The study of surrogate motherhood is of considerable interest because it goes against the norm of couples creating families. The legal framework of surrogate motherhood as well as requirements for the candidate are highlighted.

Ключевые слова: суррогатное материнство, правовая база, компенсация, свидетельство о рождении, согласие.

Key words: surrogacy, legal framework, compensation, birth certificate, consent.

Surrogacy is nowadays considered to be one of the ways to overcome the problem of infertility. And sometimes it is the only way out of this situation. However, of all the methods that help people to perform reproductive functions surrogate motherhood is the most criticized and the attitude towards it in society is very unclear. Still, surrogacy also involves ethical and moral dilemmas because intended couples seek out a woman to initiate, gestate and deliver a baby for them, usually in return for financial compensation [1, p. 411].

From the pedagogical point of view, the subject of motherhood is a special privilege that a woman experience. Giving birth to a child is recognized a special reason for pride and joy. In today's world, it is motherhood that significantly determines the role of women in the family and society. Consequently, conceiving, carrying and delivering a baby is the start of a process of care and commitment to nurture the baby through childhood and into adulthood. This is culturally expected, and the process is more unconventional [4, p. 641].

Women decide to carry an unborn child out of altruistic and material considerations. There are often situations when mothers who are healthy in terms of reproduction of offspring gratuitously help familiar infertile couples. Some surrogates may have increased feelings of self-worth and self-confidence, and develop intense and unusual friendships with the commissioning parents, particularly the commissioning mothers. Some surrogates go through a phase of positive personal development (climbing a mountain, starting a degree, studying midwifery, etc.). Relinquishment of the baby is a happy event for most surrogates, although some of them feel relief when it is all over.

Alternatively, after the successful completion of pregnancy, participation in commercial programs brings considerable profit. The amount of the compensation is on average from P1 million. Such women are entitled to monthly payments throughout pregnancy and a one-time allowance for the purchase of clothes after 5 months of pregnancy. The final payment takes place 2–3 days after delivery, signing all the necessary documents and handing over the newborn to biological parents.

Next it is worth noting the legal framework of surrogate motherhood. Surrogacy in different countries has a different legal status. For example, it is strictly forbidden in Arab countries and the Middle East. It is illegal in countries such as Germany and Sweden also there are specific laws in countries such as France, the Netherlands, Denmark, Australia and some states of the USA [3, p. 24].

According to Russian legislation, a surrogate mother cannot be genetic at the same time – this means that her egg cannot be used in the procedure. After giving birth, the surrogate mother renounces the rights to the child, and in a birth certificate the genetic parents are indicated.

Russian laws in force at the time of 2018 do not ban the use of surrogacy for men and women who are either married or live without official family status, as well as for single women and men. For a single man, the process of recording a child may later be somewhat difficult due to the existing “gaps” in the legal framework. But the State Duma of the Russian Federation is already working on this issue, where in May 2018 a bill was introduced implying correction to the Family Law to make life easier for such parents [2, p. 104].

The judicial practice on surrogacy in Russia is not as large-scale as, for example, in the United States, where women have even sought the right to participate in the upbringing of their children.

There are still challenges in the laws of our country regarding this method of reproduction. For example, it is completely unclear what a surrogate mother should do with a baby if something happens to its biological mother and father during pregnancy, for example, they get divorced or die. The procedure for refusal of biological parents from a child during pregnancy of a surrogate mother is also not regulated. Lawmakers still have work to do [5, p. 36].

The next issue to discuss is the requirements for the candidate that are quite severe. According to the Law of the Russian Federation a surrogate mother should:

- Be at least 20 and not older than 35 years.
- Have at least one child of her own.
- Not have a number of serious diseases, for example, tuberculosis and mental disorders.
- Undergo a medical examination according to the methodology of the Ministry of Health.

If the candidate is married, the spouse's notarial consent to the procedure will be required as well.

However, such cases of resorting to surrogacy remains outside the legislative regulation:

– a married couple in which a woman is basically incapable of conception and donor eggs are needed for in vitro fertilization. Or, on the contrary, a man is not capable – and then a donor's sperm will be needed;

– a single man capable of conception, plus the eggs of an anonymous donor.

One should pay attention to the fact that the surrogate mother has to sign a contract with the biological parents. There are no mandatory or standard models of such agreements. But it would be logical to indicate at least the following:

– The consent of the surrogate mother to register the birth of a child for the biological parents.
– Obligations of the surrogate mother to undergo certain medical examinations, monitor her health, adhere to the recommendations of doctors, eat right, etc.
– One or more medical institutions in which the surrogate mother should be monitored and give birth.

– The amount of the surrogate mother's remuneration depends on the successful or unsuccessful pregnancy.

– The order of transfer of remuneration: in advance with storage in a safe deposit box, as when selling an apartment, or after childbirth.

– The procedure for registration of a birth certificate.

– What expenses of a surrogate mother are compensated by biological parents and how: in advance or after childbirth, i.e. payment for medical examinations, enhanced nutrition, etc.

– Penalties of the parties for violating the terms of the contract. For example, for the refusal of a surrogate mother to give consent to the registration of a child for genetic parents.

Some surrogate mothers are looking for married couples directly, others cooperate with reproductive medicine clinics or with agencies. In the latter two cases, a tripartite agreement is signed between the biological parents, the surrogate mother and the clinic or agency [1, p. 413].

After childbirth the surrogate mother gives the baby to the biological parents along with a medical birth certificate and another important documents. According to the law everything depends on the consent of the surrogate mother: if she decides to register the child for herself, the biological parents will not be able to prevent. The Constitutional Court considers this to be fair. If the surrogate mother gives the child to the genetic parents, but refuses to provide consent, she will have to sue the registry office [5, p. 38].

That is why in the contract with the surrogate mother there should be sanctions for refusal to grant consent. And at least the obligation to return everything received under the transaction.

In case the surrogate mother gives her consent, the child is registered with the genetic parents. According to the law of the Russian Federation one should take into consideration:

– Paid maternity leave of the biological mother is not allowed. But she has the right to take leave to care for a child from the day of his/her birth and receive benefits – this is not prohibited, since mother will not have maternity leave. She is also entitled to a one-time allowance at the birth of a child.

– Biological parents are entitled to receive a certificate for maternity capital, and can also count on the repayment of up to 450 thousand rubles of mortgage by the state.

– Biological parents are entitled to standard and social deductions for the child.

And in general, in all rights, the genetic parents indicated in the baby's birth certificate are equal to ordinary parents [4, p. 645].

Thus, these aspects of surrogacy are still the most controversial and challenging issues in reproductive processes in most countries. Although, this method has many advantages but has raised a lot of challenges that requires comprehensive assessment in all its positive and negative aspects.

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**МЕЖДУНАРОДНЫЙ БИЗНЕС В ЭПОХУ КОВИД-19:
ОГРАНИЧЕНИЯ И ВОЗМОЖНОСТИ
INTERNATIONAL BUSINESS IN THE TIME OF COVID-19:
CONSTRAINTS AND OPPORTUNITIES**

Аннотация. Условия нестабильности и неопределенности, вызванные мерами по борьбе с новой вирусной инфекцией Ковид-19, способствовали трансформации всей деловой финансовой активности в целом и деятельности международных фирм и организаций, в частности. Несомненно, пандемия привела к ряду ограничений международного бизнеса, однако она также предоставила новые возможности, изучению которых посвящена данная статья. Результат анализа конкретных предприятий и статей международных экономических журналов показал, что цифровизация и электронная коммерция, набор новой клиентской базы, понимание необходимости отказа от мало доходных предприятий и заблаговременный набор талантливых сотрудников являются основными возможностями международного бизнеса в условиях Ковид-19. В то же время международные предприятия столкнулись с закрытием границ, дисбалансом в цепочке поставок, нарушением логистики, запретом на экспорт и изменением импортных тарифов.

Abstract. The conditions of instability and uncertainty caused by the new Covid-19 virus infection contributed to the transformation of all business financial activity in general and the

activities of international firms and organisations. Without any doubts, the pandemic has led to several restrictions on international business, but it has also provided new opportunities. The aim of this article is to define them precisely. The result of the case studies of specific enterprises and articles of international economic journals showed that digitalisation and e-commerce, recruitment of a new customer base, understanding of the necessity to drop out of non-essential businesses and early recruitment of talented employees are the main opportunities for international business in the conditions of Covid-19. At the same time, international enterprises faced multiple issues such as border closure, supply chain unbalance, logistics disruption, export bans and changes in import tariffs.

Ключевые слова: международный бизнес, ограничительные меры, возможности, ограничения, цифровизация.

Key words: international business, restriction measures, constraints, opportunities for international business, digitalisation.

The year 2020 would be collectively remembered by the people all over the world and would rightfully go down in the history of mankind as being infamous for bringing great hardship and misfortune to millions on this planet. The deadly pandemic due to the spread of Covid-19 virus not only changed us, the humans, but also impacted the businesses and companies. The modern world faced an unprecedented phenomenon when the people were forced to stay locked up in their homes and prohibited from venturing out in the public. Public places such as shopping centres, restaurants, car dealerships, hotels, hairdressers, and other non-food stores were closed to prevent the spread of the virus and became deserted. This resulted in a sharp decline in the revenues and profits of these businesses as the most important arteries of money flow within as well as between countries broke down due to the strict restrictions.

Nevertheless, despite all these difficulties, the human spirit driven by a hope and the desire to live freely, did adapt to the new environment and conditions. International businesses changed accordingly by getting accustomed to the new challenges and lifestyle of the consumers by adopting several novel strategies and policies. Thus, in a way, pandemic imposed constraints for the effective functioning of the companies, businesses, and start-ups but it also provided new opportunities and it is these opportunities that I would be addressing in more detail in the next few paragraphs. International business involves a large company that sells or buys business products and/or service lines in different countries. The most important indicators of international business are international trade, measured in value and volume, and investments across borders. Both these indicators were hit hard due to the Covid-19 constraints.

Governments all over the world imposed tough restrictions because of which the economic activities of several international businesses were impacted as their operations were reduced and shut down. Closing of the international borders to non-essential traffic and implementing strict stay-at-home orders further worsened this situation leading to increased uncertainty for these companies. With borders closed, it was difficult to deliver products and business units to customers as product mobility was interrupted, control the work of branches in a variety of countries, communicate with the banking system to resolve the current issues as well as the immigration was hindered, which in turn affected the migrant labourers and their movement across borders and forced people to resort to online meetings which were not always productive and useful. Travel restrictions obstruct international businesses' abilities to connect to and source knowledge from their foreign partners. Overall, such restrictions constrained the international business which, in the early phases of the pandemic, was unable to formulate an action plan, devote financial and human resources to specific projects, and keep the operating costs low. Lockdown exit strategies have varied substantially across countries and regions, but a common element among them was the practice of social distancing, which in its basic terms denotes the existence of a minimum physical distance between people during interaction and communication.

Besides, governments everywhere launched a policy of protectionism that too had a negative impact on the international business. Some countries even took measures to block the export of goods that were considered critical. For example, Russia stopped the export of several medical equipment and facilities that it earlier used to ship to other countries [5]. Thus, although the export was reduced, the loss in finances of the country were compensated by the rise in internal sales as they received the greatest support during this lockdown. Domestic sellers, companies and businesses received support from their fellow citizens due to lack of competition because of the lockdown. This led to an increase in manufacturing within the country thereby addressing the domestic concerns about the supply of essential items, which were earlier imported. A great unbalance occurred when the governments all over the world started to promote and give credits, allowances, and subsidies to national business, while the international trade was almost forgotten. Import and export challenges led to changes in the supply chain management to quite an extent. This had serious repercussions on the economy as certain resources became unavailable, logistics stopped, poor marketing practices in buying and selling products were deployed and an increase in demand along with a corresponding lack of supply led to a price increase as well as many companies went bankrupt or out-of-business/operation with some countries even going into recession. From the above, it can be deduced that the main constraints faced by the international businesses comprised of border closures, export bans, and import tariffs.

However, despite all these negative consequences, researchers also found that Covid-19 did contribute to new opportunities for international businesses that were unavailable, unpopular, and under-utilised during the normal state of affairs. Using the strategic planning technique called SWOT analysis, the set of opportunities for these businesses can be investigated and recognised, as elucidated in the next paragraph.

Firstly, the *opportunities* refer to the potential areas for investing in. This comprises of new technologies, working with restrictions in place, acquiring a deep understanding of preferences of the consumer and changing accordingly to suit their needs and demands (of the market) etc. Covid-19 brought with itself its own set of opportunities for the international businesses. One of the greatest opportunities was the ability to work remotely, something that was quite a challenge prior to the onset of pandemic. Virtual meetings became the new standard of communication almost everywhere. It meant that members of teams that met on a regular basis in the offices now did their work using advanced informational technologies. Cross-border communication became much easier than ever, which enabled international ventures to exploit these technologies further as per the market needs. A good example of this is the IT company Google, that shifted to complete remote work right after the beginning of lockdown [1]. Such working conditions made it possible to reduce operational costs (food and drinks, transport etc.) for the companies saving them billions of dollars and having a positive impact on the climate, environment, and nature. Due to the restrictions, number of vehicles on the road decreased leading to a decline in the pollution levels.

Social distancing and lockdowns also accelerated the growth of digitalisation, enterprise technology services, e-commerce retailers, cybersecurity, delivery, and courier services etc. that gave an opportunity to the entrepreneurs to invest and start-ups to grow and cater to the rising needs of the consumers, all digitally. Covid-19 also pushed commerce to the online platform. As a result, the growing use of digital services allowed for a cheaper and convenient access for the consumers, better, smoother, and faster coordination, and an increased productivity and efficiency. In addition to this, the pandemic also forced the international businesses to drop non-critical projects and direct their efforts and focus on lean business opportunities. Non-critical projects typically accounted for a huge bulk of resources and attention. The tendency to drop them allows more resources to be allocated for new essential business ideas and innovations. Zara, the well-known fashion retailer, conducted a SWOT analysis and concluded that shifting to an online platform saved them a lot of time and money [3].

Moreover, Covid-19 decreased the number of competitors in the business environment. Generally, international companies are much bigger and stronger than the domestic ones due to their presence in various countries. If some company managed to survive, it was an indication that they

were flexible and adaptive towards global external environmental changes and in times such as Covid-19, they have a strong tendency to survive and become stronger in the long run. On the other hand, there were companies that could not compete in such harsh conditions and ended up going out-of-operation/bankrupt. The rule *survival of the fittest* applies well here. The competition right now is relatively low, and the task of a good manager is to maintain apply wisdom and experience in planning, developing, and implementing a careful strategy for the benefit of the organisation to stay on track and achieve the companies' objectives [6]. This is the right time to think and analyse the opportunities available to a company and develop a strong, consumer-centric competitive advantage. This could prove to very beneficial for the company.

Finally, the pandemic has created an unprecedented opportunity to hire great talent. Well-capitalised and visionary long-term thinkers understand that layoffs, furloughs, and payment cuts hit a lot of talented workers. Therefore, this could be a right time to find and hire them to provide one's business with skilful and knowledgeable staff [2]. Also, the labour market is currently flooded with jobseekers. According to the May 2020 edition of the Economist, in response to this trend, the business of large global search firms increased by 9% to 15% compared to the last year [4].

To summarise, the main opportunity for international business lies in digitalising and e-commerce, developing a set of new customers and competitive advantage, understanding the necessity to drop out of non-essential businesses and in hiring talented employees in advance. Furthermore, I would like to state that the international business has undergone a tremendous shift due to the Covid-19 restrictions, that includes border closure, supply chain unbalance, logistic violation, export prohibition and changes in import tariffs. New collaborations and interactions developed between different entities and areas of business that seemed previously less probable. At the same time, international businesses also adapted to these new environmental changes and adopted new strategies to cope with these challenges. One of the key elements for a successful implementation of these strategies is the correct understanding and interpretation of the available opportunities that these new conditions/restrictions present, which are different from the traditional ways of conducting and managing a business. Above mentioned factors such as channelling efforts towards projects of higher relevance, an abundance of skilled unemployed people (jobseekers) in the market etc. play an integral role in the sustainable operation of the businesses and companies.

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ИСТОРИЯ ШОТЛАНДСКОГО МУЖСКОГО КОСТЮМА THE HISTORY OF SCOTTISH MALE COSTUME

Аннотация. Статья посвящена истории возникновения и развития шотландского мужского костюма. В работе рассмотрена эволюция костюма от раннего Средневековья до конца XIX века, пред ставлены свидетельства авторов-очевидцев. Объектом исследования является шотландский мужской костюм. Предмет исследования – процесс его становления и видоизменения на территории Шотландии. Целью авторов является выявление основных особенностей и тенденций в развитии шотландского национального костюма. Авторы приходят к выводу о том, что вплоть до XVII века одежда шотландцев копировала ирландскую, что было обусловлено особенностями культурно-этнической истории региона. Прекращение поставок красителей и сырья с территории Ирландии привело к появлению новых самобытных явлений в развитии национального костюма. Именно с XVII–XVIII века в Шотландии создаются широко известные большинству предметы гардероба – килт, спорран, тэм, меховой бонет, тартан.

Abstract. This article is devoted to the history of emergence and development of the Scottish male costume. The following article covers the evolution of the costume from the early Middle ages up to end of XIX century, and is supported by the claims of the authors with first-hand experience in the subject matter. The subject of the research is the Scottish male costume. The scope of the research – is the process of its genesis and alteration on the territory of Scotland. The authors goal is to identify the peculiarities and trends in the development of the Scottish male costume. The authors came to a conclusion that up until the XVII century, Scottish clothes didn't differ from the Irish, due to the cultural attributes of the ethnic and cultural history of the region. The stoppage of shipment of dyes and raw material from the territory of Ireland, contributed to the emergence of the new distinct trends in the development of the national costume. The XVII–XVIII centuries in Scotland marked the creation of the widely known garments like kilt, sporran, tam o'shanter, feather bonnet, and tartan.

Ключевые слова: Шотландия, костюм, Хайленд, горцы, одежда, история повседневности, скотты, пикты, Дал Риада, гэлы.

Key words: Scotland, costume, Highland, highlanders, clothes, history of the everyday life, Scotts, Picts, Dál Riata, Gaels.

In Scotland, national men's dress is not just a relic of the past. It is still actively used by bagpipe orchestras, dancers, Scottish military units, as well as common folk during various events (weddings, awards, etc.). Many craftsmen continue to make impeccable tartans that amaze with their magnificence. Scotland managed to preserve its unique cultural and ethnic traditions thanks to the Highlands. Due to the closed clan system and special geographical conditions, the population of this region was able to accumulate the traditional features of the Celtic people (language (Gaelic Scottish), customs, mentality and the highland dress). The historiography of the history of the evolution of Scottish dress is not as numerous as studies of the political or economic history of Scotland. To date, three fundamental works have been published on this topic: "Old Irish and Highland Dress" by G. McClintock, "History of Highland Dress" by D. Dunbar and "Scottish National Dress and Tartan" by S. Reed.

The history of the Scottish male costume can be divided into three main periods. Although before we address these periods, we need to talk about Scotland as a region. From the ethnocultural point of view, Scotland can be divided into two parts – Highland and Lowland. The latter was greatly influenced by the Anglo-Normans, due to its openness and proximity to England. Ultimately it led to the disappearance of a large number of traditional Celtic cultural elements. Highland managed to protect and preserve many elements of the indigenous culture of the region, thanks to its nature and a unique closed clan system. Taking that into consideration, for the first two periods it would be more appropriate to use the term highlander costume, instead of a Scottish costume.

According to the written sources the first period dates from the X to XVI century. At that time Irish fashion on the territory of Scotland was the most prevalent. Primarily this was related to the ethnocultural connection of the Scotts and the Irish, since both of them are Celtic nations. Highlander costume during this period consisted of a saffron shirt (either orange or yellow), short knee-length pants, a mantel, and, according to some sources, a jacket. Many authors state that highlanders didn't have any footwear. Highlanders preferred violet, blue, and dark brown colors. The first mentions of garments with the use of tartan date to this period. Tartan is a check pattern, which uses the combination of vertical and horizontal lines to form squares filled in with diagonal stripes.

The second period dates from the XVII up to the XIX century and is tied to the beginning of the creation of a Scottish national costume. During this period in Scotland, the saffron shirt disappeared from the highlander's wardrobe. The reason was the beginning of an English campaign against Ireland, the latter being the main supplier of dyes and raw materials for highlanders. The mantel disappears around this time as well. It got replaced by what is now known as a belted plaid. This item of clothing, according to the sources, can be dated back as far as to the XVI century. Belted plaid was a large piece of fabric (mainly wool), or two combined pieces stitched together and resembled the roman toga. The process of putting on the belted plaid proved to be too difficult, which led to its transformation into a small kilt. Behind the change was the British military department, which issued a directive for the supply of a small kilt to the highlander divisions.

The third period dates from 1881 and until our days. During this period, due to the large-scale reform of the military forces, the highlander costume started to become the Scottish one. Most of the divisions recruited in Scotland received a new uniform, which included trews, highlander-style doublet, and a blue tam o'shanter. Although highlanders and lowlanders still differed in appearance, the lowlanders refused to wear a kilt, unlike the highlanders.

In our days the national costume of Scotland isn't just a relic of the past. It is still actively used by the bagpipers, dancers, Scottish military units, and regular citizens during all sorts of events (like weddings, award ceremonies, etc.). A large number of craftsmen still create fantastic and mesmerizing tartans. Thanks to Highland, Scotland was able to preserve its cultural and ethnic traditions.

Up until the XVI century, the influence of Irish fashion on the Scottish male costume can be seen. The tradition to use saffron-like colors for the shirts can be evidence of that. The reason for such continuity is the affiliation of Scots and Picts to the same group of Celtic peoples, their political and cultural affinity. The residents of the region, thanks to the closed clan system and the specific geographic conditions, managed to accumulate the traditional characteristics of the Celtic people (Gaelic and Scottish languages, traditions, mindset, and costume).

The XVII century brought some significant changes. Wars with Ireland lead to the disappearance of the already mentioned saffron shirt from the highlanders' wardrobe due to the disruption in the supply of dyes. This period also marked the appearance of one of the main symbols of the region – tartan kilt. Later, in XVIII century, kilt took the so-called “small” form, as it stands today. Attempts of the British government to put cultural pressure on the highlander were in vain. Act of 1745 became the climax of the conflict. One of the paragraphs prohibited the wearing of a kilt. However, the British government failed to enforce that rule. People and even the Lords of Scotland were still wearing the national costume, despite all the prohibitions and threats. It was eventually decided to cancel the act. The British government decided to take the opposite approach. In the first quarter of the XIX century, the popularity of the kilt grew outside of Scotland. On top of that, by the end of the century the highlander costume began to actively spread among the Scottish recruits, Lowland included, thus marking the beginning of its conversion to a Scottish national costume.

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ИМИДЖ РОССИИ В СМИ В СТРАНАХ БОЛЬШОГО СРЕДИЗЕМНОМОРЬЯ IMAGE OF RUSSIA IN THE MEDIA OF THE COUNTRIES OF THE GREATER MEDITERRANEAN

Аннотация. В тезисах отражены основные положения исследования имиджа России в СМИ в странах Большого Средиземноморья. Автор объясняет основные факторы, влияющие на восприятие страны в СМИ в странах Большого Средиземноморья, а также выделяет пять семантических закономерностей, в рамках которых Россия изображается на страницах западных публикаций. Во-первых, ее считают «ревизионистской державой», во-вторых – «глобальной угрозой», в-третьих – «авторитарной страной», в-четвертых – «агрессором на постсоветском пространстве» и, наконец, в-пятых – «инициатором новой холодной войны». Все вышеперечисленные схемы задают тон публикациям о России в СМИ в странах Большого Средиземноморья и влияют на ее восприятие обществом.

Abstract. The theses reflect the main provisions of the study of the image of Russia of the countries of the Greater Mediterranean. The author explains the main factors influencing the perception of countries in the media of the countries of the Greater Mediterranean, in which five semantic patterns are presented. Firstly, it is considered a “revisionist power”, secondly, a “global threat”, thirdly, a “threat to a new country”, fourthly, “an aggressor in the post-Soviet space” and, finally, “an initiator of a new “cold war”. All of the above schemes set the tone for publishing about Russia in the media of the countries of the Greater Mediterranean, its perception by society.

Ключевые слова: имидж государства, образ России, страны Большого Средиземноморья.

Key words: image, image of the state, image of Russia, the countries of the Greater Mediterranean.

Since 2014, the attitude of most of the countries of the Greater Mediterranean to Russia has been changing sharply for the worse. This is primarily due to the annexation of Crimea to Russia and the support of the Donbass rebels, in connection with which sanctions were imposed on Russia. The deterioration of Russia's relations with the countries of the Greater Mediterranean affected its image in the media.

The concept “image” comes from the Latin imago (image). The term was introduced into

scientific use by the American economist Kenneth Boulding in the 1950s. By image, he meant a certain behavioral stereotype that affects the actions of an individual, a group of individuals or a nation [5, p. 9].

As for the image of the state, F. Kotler gives such a definition – it is “the sum of the beliefs, perceptions and impressions of people in relation to this place” [1, p. 15]. According to the Russian international journalist P. G. Koshkin, the image of Russia consists of 5 main factors: politics, the specifics of political journalism, the personality of the president or political leader, ideology and history. All these factors are closely interrelated with each other [2, p. 479].

One of the main tools for shaping the image of the state is the media. Modern media about states and key events in international relations. Today there are several definitions of the term “mass media”. First of all, it is a set of means of communication (newspapers, magazines, radio, television, Internet publications, etc.) [3]. In a broader sense, the media is a system of messages of visual, verbal, sound information on the principle of a broadcast channel, which covers a mass audience and has a periodic form of distribution [4]. At the same time, the media have an ideological, political, economic influence on public opinion and human behavior.

Table 1. The tone of articles about Russia in the European media for the first half of 2019

Country	Articles tone		
	<i>Neutral</i>	<i>Positive</i>	<i>Negative</i>
United Kingdom	60%	1%	39%
France	70%	4%	26%
Italy	63%	13%	24%

Table 1 shows the tone of articles about Russia in the European media. According to Table 1, it can be concluded that the Italian media look more neutral, and to a greater extent the negativity is manifested in the UK media. In general, the sentiment of articles in all countries with a very low percentage of positive attitudes towards Russia, and ¼ share falls on the negative. The excess of negative over positive is dozens of times.

In Africa, even less about Russia, because the African media absorbs mainly Western media and repeats them. And the amount of fake information, anti-Russian information and Russophobia spread by Western media is repeated in African media.

According to P.G. Koshkin, there are five theses about Russia within the framework of which a certain image of our country is being constructed [2, p. 489]:

1. “Revisionist power” – this thesis is connected with the annexation of Crimea to Russia, and says that Russia is considered a revisionist power;
2. “Global Threat” – this thesis is due to the fact that the image of the strange is inseparable from its president. There is an opinion that V.V. Putin “acts as if he wants war”;
3. “Authoritarian country”;
4. “Aggressor in the post-Soviet space”;
5. “The initiator of the new cold war”.

Thus, we can conclude that all these perceptions do not arise out of nowhere: the Kremlin's actions in the international arena sometimes confirm Western fears, leading to the emergence of new stereotypes about the country. This factor is one of the main factors in shaping the image of modern Russia. After all, the image of the whole country is associated with the policy of Moscow, foreign and domestic. At the same time, the country is often identified with the personality of a political leader, towards whom the authors can experience either negative or positive or neutral feelings. However, the problem arises when journalists begin to distort reality under the influence of the values and ideals of a particular publication. After all, the ideological factor also influences the perception of Russia in the Western press: the liberal media in any case will criticize the policy of the Kremlin, which for them will always be an authoritarian and unjust institution.

Finally, the historical factor allows us to look at the problem more broadly: the emergence of new or the strengthening of old stereotypes about Russia is always the reaction of the United States

and Europe to the actions of the political leadership of our country. This reaction can be either positive or negative, depending on the conjuncture and relations between the leaders of states. A cyclical pattern of mutual perception has long been formed in the history of Russian-American relations: the romanticization of Russia is always replaced by disappointment and subsequent criticism. Under these conditions, the birth of new myths is a pattern that will retain its relevance not only today, but also tomorrow.

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**ПУБЛИЧНАЯ ДИПЛОМАТИЯ СТРАН БОЛЬШОГО СРЕДИЗЕМНОМОРЬЯ:
НА ПРИМЕРЕ ИСПАНИИ**
**PUBLIC DIPLOMACY IN THE COUNTRIES OF THE GREATER MEDITERRANEAN:
THE CASE STUDY OF SPAIN**

Аннотация. Работа посвящена теоретическим аспектам публичной дипломатии. Анализируется понимание публичной дипломатии, конкретные технологии ее реализации в Испании, как стране Большого Средиземноморья. Стратегия определяет европейскую политику как естественное продолжение национальной политики и, следовательно, рассматривает ее в качестве главного приоритета внешней политики Испании.

Abstract. The work is devoted to the theoretical aspects of public diplomacy. It analyzes the understanding of public diplomacy, specific technologies for its implementation in Spain, as a country of the Greater Mediterranean. The Strategy defines European policy as a natural continuation of the national policy and, therefore, considers it as the main priority of Spain's foreign policy.

Ключевые слова: Международные отношения, публичная дипломатия, Испания, страны Большого Средиземноморья.

Key words: International relations, public diplomacy, Spain, the countries of the Greater Mediterranean.

The global transformations of the XX–XXI centuries could not but affect public diplomacy, which is understood as the policy of influencing one state on the society of another (other) state [1], and the impact is carried out precisely for political purposes. At the same time, public diplomacy is a part of implementing “soft power” tool, which, according to J. Nae, assumes, first of all to ensure attractiveness [4]. Actually, the idea when the opposite side voluntarily and consciously makes a choice is something new that has appeared in connection with the concept of J. Nae. This is what distinguishes it from propaganda [3].

Researchers agree that public diplomacy is a key tool of “soft power” [3]. Such diplomacy, aimed at an interactive dialogue with civil society, is becoming a priority area today not only for non-governmental organizations, but also for state foreign policy institutions and professional diplomats [2]. The transformation of the foreign policy mechanism and diplomatic structures in individual countries of the European Union, and in particular in Spain, testify to this.

Due to the global financial and economic crisis, states are forced to change or improve the direction of their foreign policy. Spain plans to establish a new strategy in the international arena. The country hopes to achieve this through a policy based on a “reformed and intensive multilateral approach.” The strategy was formed at the height of the coronavirus pandemic and claims that the health crisis has accelerated the processes: the strengthening of global interdependence in an increasingly divided world, the speed of change and the growth of uncertainty.

The United States of America and the European Union are two main actors in Spain's new strategy. Spain wants “a broader agenda of bilateral relations in the economic and trade spheres” and will seek to achieve “the abolition of unfair unilateral trade measures.”

Promotion of human rights, democracy, security, feminist diplomacy and diversity act as guidelines for Spain's actions in the world.

Economic diplomacy for the decisive promotion of a new global socio-economic model is based on the principles of integration, justice and equality.

Climate diplomacy is used to resolutely defend a more sustainable, livable and greener planet. Multilateral diplomacy is a tool to strengthen global governance and promote greater regional integration, renewal and strengthening of multilateralism.

The Strategy defines European policy as a natural continuation of our national policy and, therefore, considers it as the main priority of Spain's foreign policy. In the case of Europe, the Strategy suggests certain priorities aimed at influencing European external actions as a key element to strengthen Spain's position in the world and so that it can show more leadership in global issues. This fact will undertake to intensify bilateral high-level meetings with Germany, France, Italy, Poland, Portugal and Romania, using their potential and expanding regular cooperation and monitoring mechanisms.

The opinion has been repeatedly expressed that the tasks of public diplomacy surpass the goals of a more classical direction of diplomatic activity in complexity. That is why the EU has long been discussing the establishment of its own Diplomatic Academy to train diplomats exclusively for work in the EEAS and in specific countries.

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ОСНОВНЫЕ ПОНЯТИЯ ФИЗИЧЕСКОЙ КУЛЬТУРЫ И СПОРТА **MAIN DEFINITIONS OF PHYSICAL EDUCATION AND SPORT**

Аннотация. В статье представлен краткий анализ дефиниций «физическая культура» и «спорт» на основе трактовок, предложенных ведущими специалистами в области физической культуры и спорта. Выявлены концептуальные отличия данных дефиниций и раскрыты их признаки. Авторы также раскрывают основные функции физической культуры и спорта в жизни современного молодого поколения.

Abstract. The article provides a brief analysis of the definitions of “physical culture” and “sport” based on the interpretations proposed by leading experts of this field. The conceptual differences of the definitions are identified and their features are disclosed. The authors also reveal the main functions of physical culture and sports in the life of youth generation.

Ключевые слова: физическая культура, спорт, двигательная активность, здоровый образ жизни.

Key words: physical education, sport, physical activity, healthy lifestyle.

Physical education and sports are an integral part of a healthy lifestyle and a human culture. A high level of individual physical development and the formation of cognitive, moral, psychological, social, and cultural qualities depend on the level of physical education. The active spread and popularization of physical culture and sports, especially among the younger generation, provide a "healthy" society.

Many national and foreign researchers have studied the issue of physical education as a means of maintaining and improving the health and physical development of the youth. The most famous researchers are T. Arnold, B. Ashmarin, Yu. Vinogradov, G. Glazkova, Yu. Evseev, P. Lesgaft, V. Lyakh, L. Parfenova, O. Churganov, Yu. Yanson, etc.

Physical education is the only subject in general compulsory education that is directly related to students' health. The concepts of physical education, health and sport are therefore interrelated and interdependent [4]. Physical education provides a basic level of general physical education and training. It provides students with a basic set of necessary physical abilities and habits.

Sport is a natural part of physical culture and is a combination of material and spiritual conceptions. People do sports for playful physical activity [1, p. 10].

Sport is distinguished from physical culture by its competitive nature. It stands in many roles. On the one hand, as a means of health promotion and psychophysical improvement, as an effective way of recreation and restoration of efficiency. On the other hand, sport can play the role of public entertainment and professional activity [2, p. 258].

It should also be noted that sport is necessary to contribute to the positive development of society, to encourage people to engage in physical activity consciously. Sport supports a person's resource state [3, p. 306].

Physical education and sports have several essential functions in the life of modern society:

- The developing function is to improve all the physical essential strength qualities of human beings;
- The educational function is aimed at enhancing the endurance and tempering of the human spirit;
- The educational function is to make people aware of the theory and history of physical education and sport and their significance in the life of the person;
- The health and hygiene function, which is related to the lack of physical activity, the development of hypodynamia, the reduction of the body's resistance, etc.;
- The general cultural function when physical education and sports organize and fill spare time with useful and exciting activities [5, p. 408–409].

Thus, the essence of the process of physical education is the assimilation of actual elements of cultural, spiritual, social values demanded by the individual and society. The current trend of modern society is a “healthy lifestyle”. It can be considered as a lifestyle aimed at rejuvenation and recovery of the body, abandoning bad habits, creating an optimal regime of the day with proper rest, productive work, and physical activity.

We believe that school-based physical education classes can act as a major reserve for maintaining healthy lifestyles and motor activity of students. Physical education can also stimulate a degree of engagement in regular physical activity and exertion, which is essential for growth, welfare, and harmonious youth development.

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МИГРАЦИОННЫЕ ПРОЦЕССЫ В РЕГИОНЕ БОЛЬШОГО СРЕДИЗЕМНОМОРЬЯ MIGRATION PROCESSES IN THE GREATER MEDITERRANEAN REGION

Аннотация. Статья посвящена вопросам миграции в регионе Большого Средиземноморья, а именно выявлению закономерности переселения людей из менее развитых стран Севера Африки в страны Юга Европы из-за сильной финансовой поддержки последних. В работе раскрыты основные причины оттока людей из мест их жительства, ключевые направления переселения, а также проблемы, которые влечет за собой неконтролируемая миграция.

Abstract. The article is devoted to migration issues in the Greater Mediterranean region, namely, the pattern of resettlement of people from the less developed countries of North Africa to the countries of Southern Europe due to the strong financial support of the latter is revealed; the main reasons for the outflow of people from their places of residence, the main directions of resettlement, as well as the problems that uncontrolled migration entails are revealed.

Ключевые слова: миграция, глобализация, территория, экономика, миграционный кризис, Большое Средиземноморье.

Key words: migration, globalization, territory, economy, migration crisis, the Greater Mediterranean.

Today the problem of migration is very relevant. It is considered not only as a simple movement of people, but as a complex global process affecting many aspects of socio-economic life. In recent years, its scale has been steadily growing. In 2019, the number of international migrants worldwide reached almost 272 million, compared with 153 million in 1990. Between 1990 and 2019, the number of international migrants worldwide increased by about 119 million [10].

The Greater Mediterranean is a special macroeconomic region, acting as one of the key spaces of modern world development. The migration processes of this territory have a certain pattern, which is expressed in the movement of people from the countries of the “South” to the countries of the “rich North”: the flow of migrants from the countries of North Africa and the Middle East to Southern Europe.

According to the British researcher E.G. Ravenstein in addition to the economic reasons for global resettlement, territorial proximity plays an important role. Most migrants practice moving short distances within their own or neighboring macroregion [10].

It is also worth noting that migrants spread unevenly. They tend to get to more developed countries, such as Spain, Italy, France. The reasons for this choice are high social and financial support. Today's migration in Western Europe is characterized by the unification of several flows at

once into a single powerful movement. It is based on legal visitors, illegal economic migrants, political and military refugees [7].

The sea routes used by illegal immigrants turned out to be unsafe. The number of migrants who have arrived in Europe since the beginning of the year via the Mediterranean Sea has reached 17 thousand. According to the International Organization for Migration (IOM), more than 440 people have died or are missing. The overwhelming majority of migrants and refugees went to Greece (7839) and Spain (7202). Italy received 873 people, the rest – Cyprus and Malta [2]. To prevent the loss of life in the Mediterranean, the Italian government launched the Mare Nostrum program in 2013, which involved Italian warships and aircraft. In 2014, it was replaced by the pan-European programs “Triton” and “Poseidon” [11].

The main ports where migrants from other countries arrive for further transportation to Europe are: Lampedusa in Italy (accepts up to nine thousand per month); Malta – 6000 per month; Kos in Greece – 4000 monthly according to data for 2015 [4].

According to the infographic of “migration routes” compiled by the European border control agency Frontex, a number of migration flows can be identified in the Mediterranean region and their direction can be determined: West African and Western Mediterranean (to Spain), Central Mediterranean (to Italy: the island of Sicily, Apulia, Calabria), a circular route from Albania to Greece, the Aegean route (Eastern Mediterranean and Western Balkan – to Greece) [1]. It should also be noted that the routes differ by national and ethnic composition. For example, people from sub-Saharan Africa, Morocco, Guinea, Mali, Ivory Coast mainly seek to Spain, while those from Tunisia, Eritrea, Sudan, Pakistan, Iraq, Nigeria seek to Italy; those from the Syrian Arab Republic, Iraq, Afghanistan, Cameroon, and the Democratic Republic of the Congo seek to Greece [5].

In addition to the above reasons for resettlement, there are others that have led to the migration crisis in Europe. In 2014–2015, Europe faced the most serious migration crisis in recent decades. European countries have been overwhelmed by a wave of illegal migrants from Africa and the Middle East. If in 2000–2010 20–25 thousand people a year illegally came to Europe, then in 2014, according to the IOM, 900 thousand people arrived in Europe, in 2015 – 1.048 million people (according to the EU Border Control Agency Frontex, 1.8 million).

The reasons for the increase in the migration flow to Europe were the events in the Arab world in 2010–2011 (the “Arab Spring”) and the subsequent internal political destabilization in a number of countries in North Africa, the Arabian Peninsula and the Middle East. First of all, these are the wars in Syria and Libya, the expansion of the activities of the Islamic State terrorist group in Syria and Iraq, the complication of the security situation in Afghanistan due to the activation of the Taliban (the Taliban movement is banned in the Russian Federation), as well as the aggravation of socio-economic conditions in a number of sub-Saharan countries.

Another reason for the increase in migration was the expansion of the network of criminal organizations involved in people smuggling. In 2015 alone, according to Europol estimates, more than 90% of illegal migrants who arrived in Europe used the services of smugglers. The profit of the criminal network ranged from \$ 3 billion to \$6 billion. The main springboard for the transfer of illegal immigrants to the EU is Libya [3].

Below are the data on movement in the Mediterranean for the period 1990–2019 (Table 1) [6].

Table 1. Dynamics of the number of migrants in the countries of the Greater Mediterranean for the period 1990–2019 (Thousand people)

Countries	Number of migrants, thousand people.							Growth rates in 2019 to 1990, %
	1990	1995	2000	2005	2010	2015	2019	
Albania	66,0	71,4	76,7	64,7	52,8	52,0	49,2	-25,5
Algeria	274,0	262,0	250,1	194,7	217,0	239,5	249,1	-9,1
Greece	618,1	857,9	1 111,7	1 190,7	1 321,1	1 242,9	1 211,4	96,0
Egypt	173,8	167,0	184,8	285,0	310,0	353,6	504,1	190,0

Israel	1 632,7	1 792,2	1 851,3	1 889,5	1 950,6	2 011,7	1 956,3	19,8
Spain	821,6	1 020,1	1 657,3	4 107,2	6 280,1	5 891,2	6 104,2	643,0
Italy	1 428,2	1 775,0	2 121,7	3 954,8	5 787,9	5 805,3	6 273,7	339,3
Cyprus	43,8	61,9	80,1	117,2	191,9	192,0	191,9	338,1
Lebanon	523,7	608,3	692,9	756,8	820,7	1 973,2	1 863,9	255,9
Malta	15,1	17,7	21,5	24,6	33,0	52,6	84,9	462,3
Morocco	54,9	50,4	53,0	54,4	70,9	92,4	98,6	79,6
Monaco	20,4	21,1	21,8	21,3	21,1	26,0	26,5	29,9
Syria	714,1	830,6	834,9	878,3	1 787,6	871,2	867,8	21,5
Tunisia	38,0	37,9	36,7	35,0	43,2	56,5	57,5	51,3
Turkey	1163,7	1 216,2	1 281,0	1 319,2	1 367,0	4 346,2	5 876,8	405,0
France	5 897,3	6 088,0	6 278,6	6 737,6	7 310,0	7 874,2	8 334,9	41,3
Croatia	475,4	674,1	585,3	579,3	573,2	561,1	518,1	9,0

Based on the data on the number of migrants in the Mediterranean countries, the largest influx of migrants can be noted in Spain (+643%), Malta + (462.3%), Turkey (+405%) and Italy (+339.3%). If we rely on the data of absolute indicators, then Greece, Israel, and France are also attractive. Countries such as Albania, Algeria, Egypt, Cyprus, Malta, Morocco, Monaco and Tunisia, for various reasons, have accepted a minimum number of migrants in their territories. Moldova, Bulgaria, Slovakia and Cyprus do not differ in the influx of migrants, in each of these countries there are from 100 to 200 thousand migrants.

All legal and illegal migrants in Europe receive social benefits before being granted refugee status. For example, while the issue of a particular person is being resolved, he must live in a special center or refugee camp, receive hygiene items, clothes, shoes (once), money for personal expenses, and use free medical care. It is worth paying attention to the size of social support in Spain and Italy, the EU countries have the largest increase in migrants (643% and 339.3%, respectively). According to data for 2020, Spain pays 51.6 euros, an additional 18 euros for each child under the age of 18, and a travel card is issued for a month and 363 euros per year for clothes; Italy – 35 euros per day and 2.5 euros for pocket expenses [6].

Some politicians are increasingly expressing the opinion that the reason for the migration crisis was not the massive influx of immigrants from Asia and Africa, but the inability of the EU countries to agree among themselves on a competent and even distribution of visitors across their territories and providing them with the means necessary for life. As a result, Central Europe took the brunt of the blow, and countries such as Poland, Slovakia, the Czech Republic and Hungary, members of the Visegrad Group, refused to open their borders to refugees at all.

European countries, faced with the consequences of the influx of new residents, are beginning to realize the negative results that migrants from Muslim countries bring with them in terms of security and economic stability [9]. It is possible to identify the main problems faced by European countries:

1) Differences in national mentality lead to demographic imbalance. European residents usually have 1-2 children, while refugees from the East and Africa are known for their numerous families. In the EU, the population is aging and shrinking, as a result of which in a few years the number of migrants may equal the number of local residents.

2) Migrants, seeking to gain a foothold in a new place, agree to work for a lower fee than the national average. As a result, the overall level of wages decreases, which is negative for indigenous people who are accustomed to a certain level of income.

3) Constantly arriving migrants undermine the economy of EU countries. Since the EU migration policy implies social support, this generates a forced redistribution of funds to special funds by reducing the financing of its citizens.

4) People who have crossed the border illegally and do not have an official source of income are forced to resort to criminal methods, thereby worsening the criminal situation. Since some

migrants are resettled illegally, criminal structures use this problem for their own purposes. They force people to engage in illegal activities (drug sales, slavery, illegal organ transplantation).

5) Migrants do not try to assimilate, they create their own control zones, where they maintain their foundations, customs and habitual way of life. An additional danger is created by the fact that such zones can easily become controlled by radical forces from ISIS or other similar organizations.

6) People from Africa and Asia have become a source of various infections that Europeans are not used to. In addition, in the locations of refugee camps, in violation of established sanitary standards, spontaneous landfills have formed, threatening the ecology and health of residents of the regions. For example, in the Moria camp on the Greek island of Lesbos, which was designed for 2,800 people, 15 thousand people lived for many months [2; 8].

Thus, modern migration is conditioned by various factors (the level of economic development, the historical and national specifics of the country, the actions of the political elite, the war, demographic characteristics, personal motives, etc.). Migration processes in the Mediterranean region have a special specificity. Thus, the “pressure” of migrants “triggered” the political crisis of the European Union, outlined a number of miscalculations in its migration policy, pointing to the failure of the “managed migration” program, showing the short-sightedness of the policy pursued by a number of Western states in Africa, the Arabian Peninsula region and the Middle East (the “Arab Spring”, the elimination of Gaddafi, the war in Syria, “support” of the terrorist group “Islamic State”).

The promotion of orderly, safe, legal and responsible migration should be manifested not only in the implementation of policies to regulate the level of immigration, the availability of certain policy measures to attract highly skilled migrants, but also the adoption of measures to prevent illegal migration, which creates numerous problems for countries of origin, transit and destination, as well as for migrants themselves. There is a need for historical changes at the global level in the regulation of migration processes with the participation of the United Nations, which are manifested in the conclusion of two global treaties: the Global Treaty on Safe, Orderly and Regular Migration and the Global Treaty on Refugees.

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**ПРОБЛЕМЫ НЕОБХОДИМОЙ САМОЗАЩИТЫ
В ПРАВОВОЙ СИСТЕМЕ РОССИИ
THE PROBLEMS OF NECESSARY SELF-DEFENSE PRACTICE
IN THE RUSSIAN LEGAL SYSTEM**

Аннотация. В статье рассматривается вопрос расширения и изменения института самообороны в юридическую практику Российской Федерации. Автор подчеркивает, что право на необходимую самозащиту своей жизни и здоровья, а также своего имущества является правом гражданина и человека, и должно быть зафиксировано более точно на законодательном уровне. В данной работе автор приводит примеры из юридической практики и аналоги решения этой проблемы из иностранных государств, так же предлагает перечень необходимых изменений и дополнений, которые необходимо внести в законодательные акты для регулирования важных общественных отношений в государстве.

Abstract. The article deals with the issue of expanding and changing the institution of self-defense in the legal practice of the Russian Federation. The author emphasizes that the right to the necessary self-defense of one's life and health, as well as one's property, is the right of a citizen and a person, and should be fixed more precisely at the legislative level. In this paper, the author gives examples from legal practice and analogues of solving this problem from foreign countries, also offers a list of necessary changes and additions that shall be made to legislative acts to regulate important social relations in the state.

Ключевые слова: самозащита, необходимая защита, права человека, конституционные права, юридическая практика, уголовный кодекс, правоприменение, теория и практика, правовые прецеденты.

Key words: self-defense, necessary defense, human rights, constitutional rights, legal practice, criminal code, law enforcement, theory and practice, legal precedents.

The implementation of an institution of the necessary defense is currently one of the most pressing and acute problems of modern society. We constantly find the cases of exceeding the limits of necessary defense in the media, on the Internet and television where the defending person is almost all the time held criminally liable, and only a small number of them can prove their innocence in such cases. Therefore, it is advisable to characterize the phenomenon of necessary defense as fully as possible, to define the boundaries of necessary defense overstepping this boundary and to consider effective ways of resolving the issue.

The institution of necessary defense closely correlates with constitutional human rights [4, p. 6, 22; 7; 45]. That is why there is a need for clear, systematic review of such precedents by the court.

The aims of this article are to contribute to a change in the legislative and judicial approach to the consideration of precedents; to analyze the articles of the Criminal Code relating to the institution of necessary self-defense; to help eliminate legal nihilism of citizens (audience).

It is necessary to establish the definition of self-defense. According to Article 37 of the Criminal Code of the Russian Federation necessary self-defense is a lawful suppression of socially dangerous encroachment in the protection of the interests of an individual, society or the state by inflicting harm on an assailant, which outwardly resembles a crime. Causing harm to an assailant is a natural right of any person.

However, despite the statutory norms for necessary defense in criminal law practice, there are many problems with its application. First of all, it is connected with the fact that there is no unified judicial practice of consideration and resolution of such cases.

One of the vivid examples from the court practice, which has angered the public, can be described as follows: in 2005, a young woman, defending her honour, killed the rapist, who was her private taxi driver, she called late at night. He demanded intimate services from the woman. The woman stabbed the driver into the leg. A few hours later, the owner of the car bled to death. The court found the girl guilty, handed down a suspended sentence, and ordered her to pay moral and material damage to the dead man's father. The public did not agree with this court decision, which resulted in pickets and demonstrations. As a result, the highest court reversed the conviction and found the girl not guilty of the crime, applying Article 37 of the Russian Criminal Code [7].

Another example is the case against Citizen X under Article 108(1) of the Criminal Code of the Russian Federation. A fight ensued between Citizen X and citizen Y, where citizen Y grabbed Citizen X by the throat and started strangling him. Citizen X found a knife on the floor and stabbed the attacker once. The court considered the actions of Citizen X to be in excess of necessary defense, considering that he could have escaped from citizen Y. Citizen X's conviction was not reviewed in the future [1].

The above examples raise the question: when does the moment of exceeding the limits of necessary defense come? No one can give an answer to this question now and it remains essentially an open question.

There is also an equally pressing question: How do I protect my property? Such a norm is not enshrined in the Criminal Code of the Russian Federation in any way, which is a strong problem today.

In the legal framework of the Russian Federation, in order to recognize the harm caused by the defender to the attacker, certain conditions must be provided. These conditions include:

- a) The necessary defense must not go beyond the actions necessary to suppress them;
- b) The method of defense chosen by the defender must be proportionate to that used by the attacker.

If we turn to the practice of foreign countries such as the United States and the United Kingdom where this issue has long been resolved there, we can find out a person has a full right to defend not only himself, but also his property, which is quite natural from the author's point of view.

Foreign legislations give more detailed regulation to the institute of necessary defense. As a rule, foreign legislations give separate chapters on necessary defense, fully describe cases of exceeding the limits of necessary defense and make one criminally responsible for such exceeding. The German Criminal Code, for instance, says that self-defense is a ground excluding criminal responsibility [10, p. 23].

Another foreign country example is Spain, which contains provisions stating: "one who has acted in defense of his own person or rights or in defense of the person or rights of another person shall not be criminally liable" [9, p. 50].

The same effective law enforcement in Switzerland, according to Article 1 of Chapter 24, states that a person is exempt from criminal liability in the case of self-defense and defines self-defense [8, p. 25].

There are many scientific concepts in criminal law scholarship concerning the institution of necessary defense, one of which is the theory of "necessary harm" [5]. The basis of this theory is that the defender has the right to inflict such harm on the assailant, as it is necessary to prevent a particular attack, irrespective of whether the defense is proportionate or disproportionate to the attack. From our point of view, this theory should become the most acceptable theory for Russian society in general and for criminal law in our country in particular, because when a person is attacked, his first concern shall be how to save himself and not to be attacked. The victim shall not think about how not to exceed the limits of necessary defense and not to cause disproportionate harm to the attacker.

Having been attacked while defending himself, the person is in a mental and emotional state where he cannot clearly determine the boundaries of when the attacker has ceased the attack, whether he is physically able to offer any resistance or continue the attack after the defensive action has been taken. In addition, the defender is unable to assess the severity of the harm to attacker's life and health caused by the means and methods used while self-defense.

In our opinion, in order to regulate the institution of necessary defense in a more detailed and comprehensive way, we should make the following changes:

1. To introduce amendments into Article 37 of the Criminal Code of the Russian Federation decriminalizing criminal liability in respect of a person who has acted not only in defense of himself, but also in defense of the person and rights of another person;

2. To develop a separate chapter on necessary defense which would specify when a person exceeds the limits of necessary defense;

3. To introduce into the Criminal Code the norms that would partly decriminalize liability for defending property, i.e. in which specific cases it would be considered necessary defense against an encroachment on property;

4. Systematize all jurisprudence on the issue of necessary defense.

Based on many judicial precedents we have found out that the legal institute of necessary self-defense in the Russian Federation is incomplete and not entirely correct, which contributes to wrongful court decisions in such cases and, consequently, unfairly punished people who were just defending their lives and the lives of loved ones, as well as their property.

Moreover, the rule aimed at regulating precedents on self-defense and protection of property rights against criminal encroachment is not enshrined in the criminal code at all. Therefore, the legal institute of self-defense has a chaotic approach to such precedents, which results in unfair court decisions in such cases.

We have examined the approaches and solutions to this problem:

1. Article 37 of the Criminal Code should be amended in favor of the defending person defending his life and health;

2. Supplement the Criminal Code to add a provision regulating self-defense aimed at protecting property rights against criminal encroachment;

3. Systemize judicial practice by analyzing past case law on self-defense.

Thus, self-defense is currently the most important institution of criminal law, but at the same time an institution that is poorly regulated by legislation and also ambiguous, the practice of law enforcement of which relies not so much on legislation as on the subjective opinion of the judge, who must decide whether a person is guilty or not.

Russian law shall focus on improving the institute of necessary self-defense and develop a separate one on necessary self-defense. The right to defend one's property will also be included in the institute of necessary self-defense. Unfortunately, the legislator has not yet considered such a plan for the development of the institute, being involved in other projects and ignoring such a very important aspect, which directly affects the constitutional rights of man and citizen.

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**ИНВЕСТИЦИОННАЯ ПРИВЛЕКАТЕЛЬНОСТЬ ГОСТИНИЧНОЙ ИНДУСТРИИ
В КРЫМУ И ГОРОДЕ СЕВАСТОПОЛЕ
INVESTMENT ATTRACTIVENESS OF THE HOTEL INDUSTRY
IN THE CRIMEA AND THE CITY OF SEVASTOPOL**

Аннотация. В данной статье проведен анализ инвестиционной привлекательности гостиничного бизнеса в Крыму и городе Севастополе. Выявлены проблемы и недостатки, препятствующие вливанию инвестиций в гостиничный бизнес республики и города Севастополя. Изучено современное состояние, конкурентные преимущества и перспективы дальнейшего развития данного бизнеса. Определено, что для повышения инвестиционной привлекательности гостиничного бизнеса необходимо создание целенаправленной политики и стратегии развития данной отрасли.

Abstract. The purpose of this article is to analyze the investment attractiveness of the hotel business in the Crimea and the city of Sevastopol. The problems and shortcomings that hinder the infusion of investments into the hotel business of the republic and the city of Sevastopol are identified. The current state, competitive advantages and prospects for the further development of this business have been studied. It has been determined that in order to increase the investment attractiveness of the hotel business, it is necessary to create a purposeful policy and development strategy for this industry.

Ключевые слова: туризм, гостиничная индустрия, инвестирование, инвестиционная привлекательность, Республика Крым, Севастополь.

Key words: tourism, hotel industry, investment, investment attractiveness, Republic of Crimea, Sevastopol.

The hotel business in the Crimea and the city of Sevastopol is an industry that, with a competent approach, is capable of generating large profits. The region is quite attractive for investment, as it has a favorable economic and geographical position, and also has all the conditions to have a good recreation. Favorable climatic conditions, unique natural resources, the presence of cultural and historical heritage, resorts and health facilities make this possible.

The total number of collective accommodation facilities in the region is 781 units, of this number 357 units are hospitality facilities, the rest are sanatorium-resort medical institutions. Due to the active interest in visiting the region among tourists, this year the number of hotels in the Crimea and the city of Sevastopol increased by 24%. Experts also suggest that the number of hotels may increase next year to 680-700 with the current pace of development of the republic.

In 2017, three new hotels and eight housing in existing hotels and sanatoriums were opened on the territory of Crimea:

- 4 housing in the «Yalta Intourist» hotel complex in the “Green Park” territory;

- “Alye Parusa” hotel housing in Yevpatoria;
- “Villa capri” hotel in Shchelkino;
- house “Seaside Park Manor” in Alushta;
- building of the hotel “Bristol” in Yalta;
- villas “Diana” and “Pallada” in Gaspra;
- “Gray INN” hotel in Feodosia.

The southern coast of Crimea is the most popular among tourists: the cities of Yalta, Alupka, Alushta, Sudak and various adjacent villages. All year round, the number of tourists arriving in the republic for recreation in this zone reaches 40–60%. It is noteworthy that the South Coast accounts for a significant share of the room stock – more than 13 thousand units, just over 50% falls on sanatoriums. The total number of temporary accommodation facilities in this area is currently 113, excluding mini-hotels and guest houses with less than 15 rooms. In terms of the number of facilities, more than half are various hotels. The largest of them, like on the entire peninsula, is the Yalta Intourist hotel complex with a total of 1186 rooms.

It should be noted that investments from foreign investors do not come to Crimea in large quantities. There are still a small number of internationally branded hotels in the region. This is due to the insufficient development of the region in relation to world standards. In the current period of time on the peninsula, one can distinguish such chains as: Best Western International (North America) - the Best Western Sevastopol hotel, Premier hotels and resorts (Ukrainian chain) – the Premier Palace Hotel Oreanda in Yalta, Atelika (Russian chain) – «Sea corner» hotel in Alushta. Also, such hotel facilities include the hotels «Palmira Palace», «Villa Sofia», «Levant», «Villa Elena», «Primorsky Park», «Crimean Breeze», «Agora», located in and near Yalta, as well as Riviera Sunrise Resort & SPA in Alushta.

One of the last to enter the region was the international hotel chain Rixos, which took over the management of the Mriya Resort & Spa complex in Yalta, opened in 2014. In November 2018, the complex came under US sanctions. The hotel’s media rating rose due to the introduction of sanctions and subsequently brought advertising to the entire Crimea as a whole. However, the peninsula lacks such resort complexes. Their construction will have a positive impact on the development of the tourism industry in Crimea, which will entail an increase in investment in an investment-attractive and profitable business [5].

The settlement in Koreiz, located in the Yalta region, has become a new platform for infusion of investments. Investors plan to create a recreational zone in Koreiz, build recreational complexes, residential buildings, roads, parks, and a single embankment there. In 2017, the head of the republic's administration announced that investors are ready to invest heavily in the construction of a resort area in the village of Koreiz on the basis of the state sanatoriums «Dyulber», «Ai-Petri» and «Mishor». And already in July 2018, the health resorts were sold at an auction. The winner in the auctions was LLC «Management Company of Infrastructure Projects» [6].

A new type of tourist business is gaining momentum in Crimea. By the end of 2018, Crimea ranked fifth in the most popular youth tourism destinations. Youth tourism is a promising direction for the development of the recreation sector. The need to develop it is due to such social qualities of young people as activity, a high level of demand for inexpensive and acceptable quality tourist services.

The development of modern youth tourism in Crimea and Sevastopol presupposes the development of an appropriate infrastructure. To attract tourists to the republic, it is necessary to create youth hotels with fewer services and lower cost of living. Low cost accommodation options provide an opportunity for young people to save on paying for hotel accommodation and spend money on a full and exciting journey, including all the tourist services that the republic can offer.

Despite the fairly good indicators of the increase in accommodation facilities, the reason for the decrease in the flow of investment in the hotel business may be the current problems of the Crimea and Sevastopol as a tourist region.

The tourism infrastructure is underdeveloped on the peninsula. The level of a significant part of the hotel facilities in Crimea and Sevastopol still does not meet the modern requirements of the

hotel business. Sevastopol has a small number of equipped beaches, and Sevastopol hotels practically do not have their own beaches equipped for a comfortable stay. However, comprehensive work on the improvement of the Crimean beaches for the holiday season yielded results in 2018. That year there were 446 beaches in operation, which is 59 more than last year.

There is also a problem of developing the transport infrastructure of the republic. However, it may be of a temporary nature, since in 2018 the Crimean Bridge was opened, which greatly facilitated the way for tourists and positively influenced an increase in the flow of tourists [1, p. 110].

Another obstacle to investment in the hotel business in the region is high construction costs. The construction of the hotel will fully pay off only in about 10–15 years. An alternative option may be to buy a hotel in the Crimea or Sevastopol, which is much cheaper than construction.

A significant disadvantage of running a hotel business in this region is its seasonality. In this regard, such negative consequences arise as the fact that during most of the year the bulk of rooms in hotels do not bring income. The power of tourist flows has a significant impact on the functioning of any hotel. However, the peninsula still has every chance to overcome the seasonality and develop year-round recreation.

There is also the problem of legalizing mini-hotels in Crimea. Today, the shadow sector of the Crimean tourism industry reaches at least 50%. All hotel owners are constrained by land legislation requirements as well as tax accounting and tax rates. Entrepreneurs simply choose to hide their mini-hotels under the guise of an ordinary residential building and carry them out in accordance with all relevant documents [4].

To study the above and other problems, the program “Socio-economic development of the Republic of Crimea and the city of Sevastopol until 2020” was created. The program includes activities that have a single target orientation within the framework of the established tasks, interrelated sources of funding and implementation deadlines. There are activities and programs related to the problems affecting the development of the tourism and hotel business in the region:

- development of the transport complex – construction of a transport crossing through the Kerch Strait, reconstruction of the airport of the city Simferopol and Belbek airport, construction and reconstruction of port infrastructure facilities, renewal of the urban transport park, construction and reconstruction of highways that increase the transport accessibility of the Crimean peninsula and reformat the existing transport corridors for passenger and cargo traffic, oriented towards the Russian Federation, arrangement of checkpoints through the state the border of the Russian Federation;

- development of the social spherer – construction and reconstruction of healthcare and education facilities;

- development of a communications complex and mass communications – provision of communication channels, creation of communication networks;

- formation tourist and recreational clusters – creating infrastructure for the development of tourist and recreational clusters;

- ensuring interethnic unity – implementing measures to harmonize interethnic relations.

An argument in favor of the investment attractiveness of the hotel business in Crimea and Sevastopol is the rapid development of the tourism industry in the region. The creation of five clusters is required for the development of infrastructure facilities for the hotel business.

The implementation of clusters involves the construction of tourist infrastructure facilities at the expense of investors. On the territory of each cluster, land plots are provided for the creation of new objects, which, within the framework of the implementation of clusters, are currently investment sites [6].

Investment sites for the creation of tourist facilities are of the highest priority for attracting private investors into the hotel business of the republic.

For these purposes, the creation of the following tourist and recreational clusters is provided in the Crimea:

1. Cluster “Children's rest and health improvement” (Evpatoria) – establishing of the infrastructure of a national center for family health improvement.

2. Cluster “Healing and health-improving rest” (Saki) – establishing of the infrastructure of a mud-cure resort.

3. Cluster in the area of Lake Chokrakscoe (Leninsky district, Kurortnoye settlement) - the infrastructure of a balneological treatment and recreation complex.

4. Cluster “Black Sea” (Black Sea region) – a center for the development of extreme, archaeological and auto tourism.

5. Cluster “Koktebel” (Koktebel settlement) – a center for active types of tourism.

It is planned that the implementation of activities within the clusters will make it possible to implement a number of investment projects totaling over 170 billion rubles, including:

1. Investment potential of the “Children's Rest and Recreation” cluster – more than 50 billion rubles.

2. Investment potential of the cluster “Health and Wellness Rest” – more than 63 billion rubles.

3. Investment potential of the cluster in the area of Lake Chokrakscoye – more than 14 billion rubles.

4. Investment potential of the “Black Sea” cluster – more than 11.5 billion rubles.

5. The investment potential of the Koktebel cluster is over 31.9 billion rubles [6].

Concerning problem-resolving that reduce the attractiveness of the investment attractiveness of the hotel business in Crimea and Sevastopol, the following should be highlighted. The Ministry of Resorts and Tourism of the Republic of Crimea has developed a set of measures aimed at legalizing mini-hotels and small accommodation facilities in the region. These measures are mainly aimed at alleviating the tax burden for owners of accommodation facilities. Also, the municipal authorities are invited to adopt a resolution that provides a reduction in tax rates for owners of land plots where small hotels are located.

In addition to the proposed measures, it is proposed to provide registered small hotels with a subsidy as a reimbursement of the costs of carrying out the classification. However, hotels in Crimea and Sevastopol are not yet trying to pass it. For example, only 51 hotels are officially listed in the register of Sevastopol.

Partial implementation of the above activities has already shown positive results. Since the beginning of 2018, more than 6.4 million tourists have rested in Crimea and the city of Sevastopol, this figure exceeds the level of the same period last year. This indicator is a weighty argument for investors wishing to invest in the hotel business in the region [2].

The hotel business of Crimea and the city of Sevastopol has a high investment attractiveness, despite the existing problems in the development of the republic's resort, since through the development of programs to eliminate them and create investment sites under the leadership of the government, this type of business will flourish and develop in a positive direction.

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СПЕЦИФИКА ДЕЯТЕЛЬНОСТИ ЧАСТНЫХ ВОЕННЫХ КОМПАНИЙ НА ТЕРРИТОРИИ УКРАИНЫ SPECIFICS OF PRIVATE MILITARY COMPANIES' ACTIVITY IN UKRAINE

Аннотация. В статье анализируется место и роль частных военных компаний в современных конфликтах. Отмечается, что украинский рынок частной военной и охранной силы представляет различного рода услуги уже длительный период. Подчеркивается, что повышенная активность подобных компаний напрямую соотносится с украинским кризисом 2013-2014 гг. и последующим конфликтом на Юго-Востоке страны. Акцентируется внимание, что использование информации только из открытых источников обуславливает затруднительность получения достоверности данных.

Abstract. The article analyzes the place and role of private military companies in modern conflicts. It is noted that the Ukrainian market of private military and security forces has been providing various kinds of services for a long time. It is emphasized that the increased activity of such companies directly correlates with the Ukrainian crisis of 2013–2014. and the subsequent conflict in

the South-East of the country. It is emphasized that the use of information only from open sources makes it difficult to obtain the reliability of the data.

Ключевые слова: современное государство, наемники, частные военные компании, вооруженный конфликт, военизированные формирования, Украина, национальная безопасность.

Key words: modern state, mercenaries, private military companies, armed conflict, paramilitaries, Ukraine, national security.

The transformation of the institution of the state in the modern era, and as a result – the partial loss of the state monopoly on the use of military force, is a serious threat to national security. Today, the army, in its traditional sense, is losing its significance, which it had until the end of the twentieth century, and it is being replaced by various kinds of paramilitary formations that have more sophisticated means of solving tasks. Such structures have been developed in modern private military companies (PMCs), which can provide protection, perform security functions, as well as conduct operations outside the borders of the employer state at a higher level than state formations. At the same time, it is important to note that PMCs play an increasingly important role in armed conflicts and wars of a new type, implying a special, more sophisticated choice of means to realize their interests. In this context, a striking example is the increased activity of PMCs on the territory of Ukraine, since the political crisis of 2013–2014, and the subsequent clash in the South-East of the country.

The history of PMCs activity on the territory of Ukraine dates back to the entry of foreign companies into the Ukrainian market of security services. Thus, one of these private structures has been operating in Ukraine since 1992, providing security and safety services on the Ukrainian market. This PMC, called Group 4 Securicor-G4S (one of the largest organizations of this type; has offices in more than 125 countries of the world; the number of employees is over 600 thousand people, headquartered in London) provides services of various kinds, such as: mine clearance, consulting, training and personnel management, as well as escort and protection of persons and objects, is occasionally involved in the coast Guard [1].

In addition to G4S in Ukraine, there are other less well-known, but no less competitive PMCs operate in Ukraine, one of them is L3-MPRI (USA), which provides security services for mobile and information communications [4, p. 141-142]. Another American PMCs – “Leidos” – emerged relatively recently, in 2013, as a result of the rebranding of the old SAIC PMC, which became famous for its activities under contracts provided by the US National Security Agency, the US Department of Homeland Security, as well as the US Department of Defense. The U.S. National Security Agency, the U.S. Department of Homeland Security, and the U.S. Department of Defense. The company’s revenue for 2019 amounted to \$11.09 billion [7]. During the 2013–2014 coup d’état in Ukraine Leidos communicated with participants of the Euromaidan protest movement both in the Diaspora and in Ukraine [5].

The attractiveness of Ukraine for PMCs can be explained by a number of reasons, among which it should be particularly noted: the important geopolitical position of the state, which allows, due to regional peculiarities, to destabilize the architecture of the region, the increased demand for security structures among oligarchs, as well as the relatively cheap replenishment of personnel at the expense of retired military personnel.

It is worth noting that a sharp increase in interest and increased attention to private military companies is observed precisely during the Ukrainian crisis, so various military structures, mainly having headquarters in the United States, began to “pop up” more often in crisis points on the territory of Ukraine, especially in the Southeast. At the same time, numerous studies of open information resources allow us to state that from the period of February–March 2014 various foreign paramilitary organizations have signed contracts with the Kiev government, as well as with individual individuals

to provide services. The alleged PMCs conducted training of the AFU personnel, provided protection of persons and objects.

The peak of “information saturation” and zealous discussion in the media reaches PMCs in March-June 2014, i.e. shortly after the coup d'état in Ukraine and the beginning of performances in the South-East. During this period, PMCs coordinated individual units of the Armed Forces of Ukraine, as well as some special units, in order to suppress protest movements in the previously mentioned region. An example of this was a video published on the Internet, where several people in distinctive uniforms, not typical of Ukrainian services, walked down the street in Donetsk in March 2014. People in uniform were assigned to the American PMCs “Blackwater” (since 2010 Academi), but this assumption was not confirmed.

To date, the information struggle regarding the involvement of private foreign military formations in the conflict in the South-East of Ukraine continues. However, reliable confirmation of their direct involvement in the fighting on the side of the Armed Forces of Ukraine has not been received, and is unlikely to be received. And it is possible to evaluate and analyze the activities of these companies only on the basis of open sources of information. This “stealth” makes PMCs one of the most effective and convenient tools of the foreign policy of individual states, so, using private companies, players in the international arena achieve their goals and become beneficiaries, without resorting to open military operations.

It is noteworthy that Ukraine is not limited to some foreign PMCs, since several domestic private companies operate on its territory that provide services of this nature, while they do not call themselves “mercenaries”. Not every one of these companies is registered only in Ukraine, some of them operate on its territory, but their registration is carried out abroad. According to published international documents, there are only four such companies. The most famous of them is Omega Consulting group active since 2011, its head is Andrey Kebkalo, who has worked with one of the most controversial PMCs in his career since 2003 – “Blackwater”. In the spring of 2014, the company offered a vacancy for a “consultant”, and one of the conditions was the presence of a Kharkov, Luhansk or Donetsk residence permit. At the same time Omega Consulting officially recognized its involvement in the operations “emergency withdrawal of the Customer’s personnel from the Autonomous Republic of Crimea and Donbass [3]. Also, the information and communication department confirmed the involvement, as well as the existence of contracts concluded, regarding the participation of company employees in actions in the territory of the Donetsk and Luhansk regions, but denied the facts about the existence of obligations with government structures, “all contracts were concluded with individuals and enterprises” [3].

Other Ukrainian companies “Artan Group”, “Vegacy Strategic Services” and Albatross is less well known for its actions in crisis areas. Odessa “Albatros” and Mykolaiv “Vega” operate abroad, providing maritime transit security services for foreign shipowners, and also specialize in protecting and protecting foreign vessels from piracy [6].

Company “Artan Group” established in 2005 provides comprehensive security services for individuals and objects of protection of various types of property, exercises control over the conduct of mass events. In addition, the company had a high demand among people close to the ex-President of Ukraine – V.F. Yanukovich. It should be noted that with the support of this private company, the openly nationalist PMC Templar emerged, whose employees were repeatedly seen in combat operations in the South-East in the punitive battalion “Aidar”. Templar actively cooperates with Ukrainian nationalists and various right-wing volunteer organizations (for example, “Lvivska Brama”) [4, p. 141].

Thus, the interest of modern states in using private military companies is not unreasonably justified by their pragmatism. In the context of the transformation of the world order and the difficulty of regulating a number of socio-political processes, such formations are in great demand, mainly due to providing employer states with the opportunity to design and control conflicts at a great distance from national borders, a specialized military structure, as well as partial removal of responsibility [2, p. 113]. At the same time, one of the most important characteristics of PMCs is the latency of their

activities, which does not allow them to clearly identify their involvement in a particular military-political event.

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**ФИНАНСИРОВАНИЕ ИННОВАЦИОННОЙ ДЕЯТЕЛЬНОСТИ КАК
ФАКТОР ЭКОНОМИЧЕСКОГО РОСТА СТРАНЫ
FINANCING INNOVATION AS A FACTOR OF
ECONOMIC GROWTH OF THE COUNTRY**

Аннотация. В ходе работы были рассмотрены основные этапы, источники и формы финансирования инновационной деятельности, проведен анализ текущего состояния финансового обеспечения инновационной деятельности в России по регионам. Вследствие чего была выявлена существенная дифференциация объемов средств, выделяемых на научно-исследовательские и опытно-конструкторские работы в разных регионах. Кроме этого, была обнаружена необходимость разработки и применения гармонизированной системы бюджетного и коммерческого финансирования научно-исследовательской и опытно-конструкторской работы, а также использования прямых и косвенных инструментов стимулирования инновационной деятельности.

Abstract. Main stages, sources and forms of financing of innovation activity were considered throughout the proceedings, as well as current state of financial provision of innovation activity in Russia in different regions was analyzed. As a result, a significant differentiation of funds allocated to research and development in different regions was revealed. In addition, the need for development and application of a harmonized system of budgetary and commercial financing of research and development, as well as use of direct and indirect tools for stimulation of innovation activity has been revealed.

Ключевые слова: инновации, инновационная деятельность, инновационный процесс, финансирование, источники финансирования.

Key words: innovation, innovation activity, innovation process, financing, sources of financing.

In the era of the emergence of the sixth technological mode, when knowledge, science and information become the key factors of production, economic growth and increased competitiveness can be ensured only by a constant flow of innovation. It is these innovations that drive progress. By abandoning extensive sources of economic growth and seeking new intensive ones, it is possible to improve competitiveness and economic performance to a leading position. As a consequence, in many countries the socio-economic policy based on the introduction of innovations in all spheres, industries, complexes and sectors of the national economy becomes a priority.

The term “innovation” began to be actively used in economic research at the beginning of the XX century, and originally meant the renewal of any system. Today, the Oslo Manual provides the following definition, which is considered classical: “Innovation is the introduction of a new or significantly improved product (goods or services) or process, a new marketing method or a new organizational method in business practice, organization of jobs or external relation” [5]. However, it should be taken into account that the term “innovation” can be interpreted differently, depending on the purposes of the analysis.

To study the processes of financial support of innovation activity, it is important to classify innovations according to the following criteria:

- by degree of novelty: radical, pseudo-innovations, modifying innovations. At that, radical innovations require the largest volumes of financing both at the stage of scientific research and at the stage of their commercialization;

- by subject of application: technological, product, marketing, organizational. In this list, the first two types of innovations often require more financing than organizational and marketing ones.

When structuring the financing of innovations in the context of the stages of the innovation process, the most commonly distinguished are:

- basic research;
- applied research;
- technology development;
- industrial production;
- marketing and sales.

These stages allow us to consider the innovation process as a symbiosis of research, organizational, production and marketing activities [3, p. 55].

Let us consider the financial support of each stage of the typical linear innovation process on the basis of the model of “technology push”, which is most widely used in the practice of innovation activity:

- Stage I includes fundamental research carried out in research institutes, higher educational institutions, laboratories, etc. This stage is financed mainly at the expense of the state.

- Stage II has an applied nature: the research is carried out in various research organizations, as well as in the scientific departments of enterprises. Accordingly, funding can be provided from various sources. At the same time, it should be taken into account that at this stage it is still difficult to predict the results of research and the risk of loss of invested funds by the investor is quite high.

- At the III and IV stages, experimental work and product release in special laboratories and production shops are carried out. These stages are dominated by the enterprises' own and borrowed funds.

- V final stage of commercialization of innovation, in which the implemented innovation begins to bring profit, i.e. current costs associated with the production of innovative product (using innovative technology, the use of new marketing or organizational solutions) are covered by income.

Financial stimulation of innovation is a mechanism to promote innovation activities of enterprises and organizations, by optimizing the sources and forms of financing innovation, as well as through the use of financial instruments of the monetary and fiscal system, allowing saving money enterprises and thereby affect their innovation activity [1, p. 14].

Since innovation activities are characterized by a high degree of uncertainty and risk, the availability of various sources of financing innovation and various instruments of financial incentives for innovation is essential. The following forms of financing are distinguished: budget financing and commercial sources.

Budget financing is the largest source of funds that contributes to the development of fundamental science and large-scale scientific and technological projects. Often budget funds are directed to: the activities of public research organizations; formation of funds to support science and innovation; target programs for the development of science and innovation.

The following tools of direct state support of innovation projects at the expense of budgetary funds should be distinguished [9]:

- state procurement of innovative products;
- provision of various kinds of subsidies, grants, interest-free loans to inventors and industry entrepreneurs;
- granting tax and customs privileges;
- payment of compensatory interest from the use of innovative developments in production;
- formation of large industrial scientific clusters, technopolises and technoparks with well-developed infrastructure;

– reduction of the size of duties on patents for innovators, etc.

The main budgetary funds are: Federal Fund for Production Innovations; Fund for Assistance to the Development of Small Enterprises in Science and Technology; Russian Fund for Basic Research. In addition, to solve the problems associated with the financing of scientific, scientific-technical and innovation activities, the Regulation on the Federal Agency on Science and Innovations was approved by the Russian Federation Government Decree No. 281 of 16.04.2004 [6].

In their turn, the non-budgetary funds are formed in accordance with the Russian Federation Government Decree of October 13, 1999 “On Approval of the Procedure for Formation and Use of Non-Budgetary Funds of Federal Executive Bodies and Commercial Organizations for Financing Scientific Research and Experimental Development” and are focused on support of research and development (R&D), aimed at improvement of the technological development of the country.

Among the extra-budgetary funds, we should also highlight The Federal Fund for Industrial Innovation (FFPI) was created by the Government of the Russian Federation in 1996 and received the status of a state non-profit organization. The fund's funds are spent on supporting innovative enterprises, construction and reconstruction of high-tech industries, and other purposes on a returnable basis [7, p. 132].

The creation of favorable conditions for innovative activity and growth of investment attractiveness of high-tech industries depends largely on the use of indirect regulation tools, which include: tax benefits; provision of the right to accelerated depreciation; investment tax credit; preferential rates of utility services for scientific enterprises; issuance of state guarantees as loan security, etc. [2, p. 13].

Commercial sources. In most cases financing of applied research and commercialization processes occurs not at the expense of state funds, but at the expense of alternative sources - commercial ones. Commercial sources help to provide an innovative project with all the necessary resources: labor, material and technical and information.

The main sources of commercial financing of innovative activity are:

- self-financing of innovative activity;
- issue of shares, allowing to form the authorized and sometimes additional capital of the joint-stock company;
- funds of venture capital funds;
- bank lending;
- forfeiting;
- leasing;
- factoring;
- sale of a license to discover know-how.

On September 2, 2020, the annual report “Global Innovation Index” was presented, which contains data on the analysis of the innovation systems of 131 countries and the rating of countries by the level of innovation development. Russia ranks 47th in the ranking having lost one position relative to the level of 2019 [4]. One of the sub-indices of the final index is the financing of innovation activity. The need to study this factor of innovation activity, both at the state and regional levels, is important because the effectiveness of innovation activity, as mentioned above, is largely determined by the ways of financial support.

The fundamental process in creating an innovative product is R&D. Expenditure on research and development is a statistical indicator that expresses the actual expenditure in monetary form on scientific activity in the country. Data from the Federal State Statistics Service show that in 2018 the share of domestic spending on research and development as a percentage of Russia's total GDP was 1 percent. It is 0.11 percent less than in 2017. In 2019, this share was 1.03%. This indicator is 0.03 percent more than in 2018. In actual prices, domestic spending on research and development in the Russian Federation amounted to 1,019,152.4 million rubles, 1,028,247.6 million rubles, 1,134,786.7 million rubles, 1,174,534.3 million rubles in 2017–2020, respectively. Despite the fact that the change occurred for the better, in general we can judge about an extremely small share of money allocated to this direction [8].

The territory of the Russian Federation is vast and includes many regions, in which the level of scientific and innovation activity is significantly differentiated. According to the Federal State Statistics Service the volume of funds allocated to R&D is significantly different, which is reflected in the Table 1.

Table 1. Structure of internal expenditures on research and development by constituent entities of the Russian Federation, in millions of rubles

Territory	2020	Fraction, %
Russian Federation	1,174,534.3	100
Central Federal District	621,858.4	52.95
North-Western Federal District	155,772.7	13.26
Southern Federal District	29,806.4	2.54
North Caucasian Federal District	5,786.9	0.49
Volga Federal District	180,922	15.40
Ural Federal District	74,508.9	6.34
Siberian Federal District	86,460.7	7.36
Far Eastern Federal District	19,418.4	1.65

Most of all R&D expenditures fall on the Central Federal District, which amounts to 621,858.4 million rubles, 52.95% of all domestic expenditures. Also, the powerful share of allocations falls on the Volga and North-Western Federal districts: 15.40% and 13.26% accordingly. The smallest share of spending on research and development falls in the Southern Federal District – 2.54% (29,806.4 million rubles), the Far Eastern Federal District – 1.65% (19,418.4 million rubles) and the North Caucasian Federal District – 0.49% or 5,786.9 million rubles, in 2020 [8].

Thus, in order to evenly activate the innovation activity of the regions, the article proposes a system of direct and indirect methods of financial stimulation of innovation activity. Direct methods include: subsidies, grants, awards, scholarships, which are proposed to be provided to key participants of the innovation infrastructure of the regions, as well as to individual enterprises included in the list of innovators within the priority industries. It is also necessary to develop and apply a system of indirect instruments to stimulate innovation, including concessional lending, guarantees and insurance, which should be provided additionally to innovatively active participants.

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**ВЛИЯНИЕ ПАНДЕМИИ КОРОНАВИРУСА НА
МАЛЫЙ И СРЕДНИЙ БИЗНЕС В РОССИИ
IMPACT OF THE CORONAVIRUS PANDEMIC ON
SMALL AND MEDIUM-SIZED BUSINESSES IN RUSSIA**

Аннотация. В данной работе рассмотрено влияние пандемии COVID-19 на малый и средний бизнес в России, так как именно данная сфера особенно подвержена негативному воздействию шоковых эффектов. Кризис обострил основные проблемы МСП, существовавшие и до начала пандемии: высокая административная нагрузка, неравномерная налоговая нагрузка, недостаточная мотивация расти из малого бизнеса в средний и т.д. Рассмотрен и проанализирован комплекс мер, принятый правительством Российской

Федерации с целью минимизации негативного воздействия пандемии на сферу МСП. Вследствие чего предложены как экстренные меры помощи МСП, так и меры долгосрочного и стратегического характера. Рассмотрено и положительное влияние пандемии на российские компании: внедрение цифровых технологий, реструктуризация бизнеса, поиск новых каналов продаж и т.д. До тех пор, пока вакцины не станут широко доступны, оживление на рынке и экономический подъем будут по-прежнему опираться на продолжающуюся поддержку со стороны мер денежно-кредитной и налогово-бюджетной политики.

Abstract. This research deals with the impact of the COVID-19 pandemic on small and medium-sized businesses in Russia, since it is this area that is especially susceptible to the negative impact of shock effects. The crisis exacerbated the main problems of SMEs, which existed even before the start of the pandemic: high administrative burden, uneven tax burden, insufficient motivation to grow from small to medium business, etc. A set of measures taken by the government of the Russian Federation with the aim of minimizing the negative impact of the pandemic on the SME sector have been considered and analyzed. As a result, both urgent measures to help SMEs and measures of a long-term and strategic nature have been proposed. The positive impact of the pandemic on Russian companies has been also considered: the introduction of digital technologies, business restructuring, the search for new sales channels, etc. Until vaccines become widely available, market recovery and recovery will continue to rely on continued support from monetary and fiscal policies.

Ключевые слова: негативное влияние, комплекс мер, пандемия коронавируса, снижение, потребительские привычки, устойчивость.

Key words: negative impact, a set of measures, coronavirus pandemic, reduction, consumer habits, sustainability.

The COVID-19 pandemic plunged the global economy into the deepest recession since World War II: total closures of enterprises, rising unemployment and social tension, impoverishment of business and citizens, a colossal drop in international trade.

In Russia, even before the start of the pandemic, the economic situation was very difficult: the stagnation of the domestic economy that lasted for a decade; real disposable income of the population freezing and sometimes falling, lack of investment, low level of competition, capital flight from the country. Therefore, it is no coincidence that the disastrous impact of the pandemic on the Russian economic system manifested itself to a greater extent than in other countries of the world. At the end of 2020 the drop in GDP was 3.1% [5], the unemployment rate increased by 1.5 p.p. [5], tax revenues to the consolidated budget decreased by 7.6% compared to the previous year [4], the industrial production index as a percentage of the previous year amounted to 97.4 [5], the total volume of new foreign direct investment in Russian non-financial companies amounted to 1.4 billion dollars [6], which is more than 20 times less than in 2019.

The sphere of small and medium-sized enterprises (further SMEs) has also been in a situation of stagnation in the past few years, which has significantly reduced its resilience in the terms of shock effects (Table 1) [5]. And without the pandemic it became clear that the target indicators of the Strategy for the Development of Small and Medium Enterprises (an increase in the share of SMEs in GDP to 40% by 2030) and the national project "Small and Medium Enterprises and Support for Individual Entrepreneurial Initiatives until 2024" (bringing the share of SMEs in GDP to 22.9%) are unattainable.

Table 1. Indicators of the SME sector in Russia

	2010 г.	2015 г.	2016 г.	2017 г.	2018 г.	2019 г.	2020 г.
Share of SMEs in GDP, %	19,9	19,9	21,6	21,9	20,2	20,8	19,8

Share of employed in SMEs, %	27	28	26	27	27	26	27

The coronavirus pandemic in Russia affected about 4.17 million companies and individual entrepreneurs out of a total of 6.05 million, that is, up to 67% of small, medium and large enterprises and individual entrepreneurs. Due to their characteristics, SMEs are particularly susceptible to the multifaceted negative impact of the pandemic on economic relations. On the one hand, it is affected by significant reduction in the market supply. Companies are closed due to quarantine measures and other restrictions, the termination of the components supply, a decrease in the workforce. On the other hand, a sudden and strong decline in demand for products and services leads to a reduction in revenue and prevents SMEs from operating due to lack of funds and a small supply of liquidity. The determining factor is a change in consumer habits, both due to the fear of infection and due to the limitation of personal income due to layoffs or wage cuts, which ultimately leads to a circular effect.

At the peak of quarantine 56.1% of SMEs suspended their activities [3]. In 2020, a drop-in demand affected 80% of companies and demand has not recovered in 52.6% of companies so far [3]. According to the RSBI Index in April 2020 the business activity of SMEs set a new minimum value in 5 years and amounted to 38.5 points. Historically, the youth RSBI (entrepreneurs under 35 years old) maintains values above the average for SMEs and in April 2020 shows a value 2.5 points higher than the general index. Young entrepreneurs show higher rates of sales and investment, which indicates their ability to respond to changing conditions during a pandemic more quickly.

The crisis has exacerbated the main problems of SMEs:

- 1) high administrative burden:
 - amounts of fines are disproportionate to violations,
 - inability to control all types of violations due to the huge number of articles on administrative violations,
 - poor informing of requirements;
- 2) uneven tax burden;
- 3) lack of motivation to grow from small to medium business;
- 4) growth of shadow employment due to the salary tax system;
- 5) overabundant reporting and workflow;
- 6) limited opportunities for unsecured lending or lending secured by working capital, equipment;
- 7) growth of regulatory and financial burden;
- 8) lack of interest from the authorities at the municipal, regional and federal levels in the development of small and medium-sized businesses;
- 9) consideration of changes in legislation proposed by business for years.

Under these conditions, the government of the country has taken measures aimed at mitigating the consequences of the pandemic, in particular:

- exemption and deferral from taxes and insurance premiums;
- postponement of tax reporting deadlines;
- issuance of preferential loans for employees' salaries;
- deferral of loans and rent payments;
- a moratorium on bankruptcy;
- launching a special credit program to support employers employed in the most affected industries (air and road transport, leisure, tourism, hotel business, catering, additional education, organization of exhibitions, non-food trade, etc.) [2].

The total cost of anti-crisis measures to support the economy and citizens amounted to 2.7% of GDP or about 3.26 trillion rubles, particularly 835.5 billion rubles allocated to help SMEs [1].

At the same time despite the correctly designated vector of assistance to enterprises in the real sector of the economy, in practice the implementation of these measures ran into a whole range of problems, because of which the support of the federal level affected only a smaller part of business entities in Russia (about 10% of companies [3]) due to the difficulty of obtaining. Despite the

acceleration of the procedure for issuing loans at 0% to maintain employment and a decrease in the number of refusals 30% of applications were rejected [3]. According to the monitoring data "Opinion of SMEs on measures of state support during the coronavirus epidemic," 27.8% are satisfied with the support measures of the Government of the Russian Federation, 23.4% are satisfied with the response of the regional authorities.

The decisions made on support refer to tactical measures, as they are aimed at compensation for damage. At the same time, it is doubtful that measures to maintain the incomes of the population will help preserve SMEs, since these additional funds will go mainly to large network trade structures.

Consequently, there is a need to adjust the mechanisms for aiding SMEs. Despite the low share of this business in GDP (19.8% [5]) it employs many people, thus reducing social tension. In such conditions, it is necessary to focus on optimizing the infrastructure for supporting SMEs with the possible release of large funds and their redirection into direct support channels for SMEs, especially those working in the innovation sphere and the real sector. We can also add the following emergency measures:

- 1) To change the criteria for determining the victims: a decrease in revenue by more than 30% for the reference period or expand the list of victims of the All-Russian Classifier of Economic Activities.

- 2) To eliminate the requirement for a business, which has existed for more than a year to provide support measures.

- 3) To simplify the procedure for issuing loans as much as possible to maintain employment.

- 4) To change the approach to regulated tariff setting in favor of small and medium-sized manufacturing companies to assume the stability of the tariff formula.

- 5) To return to direct subsidizing of expenses for technological re-equipment: leasing, purchase of equipment, connection to engineering networks, etc.

- 6) To provide additional capitalization of regional guarantee funds and microfinance organizations.

- 7) To develop a system of cheap (at a rate of 2-3%) microloans.

At the same time, measures to provide SMEs with emergency assistance in case of emergencies are not enough. There should be long-term measures, a strategic nature, which in the future will become the basis for anti-crisis stability and further recovery of this sector. Government policy towards SMEs needs a shift towards a "high risk economy" with a focus on indicators characterizing the degree of maturity and economic sustainability, respectively, and an emphasis on tools that ensure this sustainability. Earlier government support measures did not contain a sufficient investment-stimulating component (the share of SMEs in fixed capital is half that in GDP). A business without investments and property gives rise to the ideology of a "temporary worker" for an entrepreneur, for whom in the situations as more complicated circumstances it is easier to close everything and then try to start over than to support his enterprise.

However, it must be admitted that the pandemic has not only had a disastrous, destructive impact on SMEs, but also helped Russian companies to start restructuring their business organization. We are talking about the implementation of many remote mechanisms and digital solutions, the launch of which, in the absence of extreme conditions, would be a matter of a relatively distant future. The crisis also pushed the management of companies to make complex decisions to optimize existing business models, find ways to reduce costs, develop new business areas and new sales channels. In connection with the growing trend of transferring business online and mastering sales on marketplaces, entrepreneurs today are ready to invest in effective promotion tools, particularly in the development of the websites of their enterprises, advertising costs and digitalization of their business. Proceeding from the fact that the main problem of business today is associated with a drop-in sale, entrepreneurs began to actively seek opportunities to improve their own competitiveness. This is evidenced by the RSBI index, which amounted to 54.6 points in May 2021 and reached a new all-time high, exceeding the record indicators of 2018 by one and a half points. After the restrictions related to the pandemic were lifted, entrepreneurs began to invest actively either in the development of their companies or in their preservation.

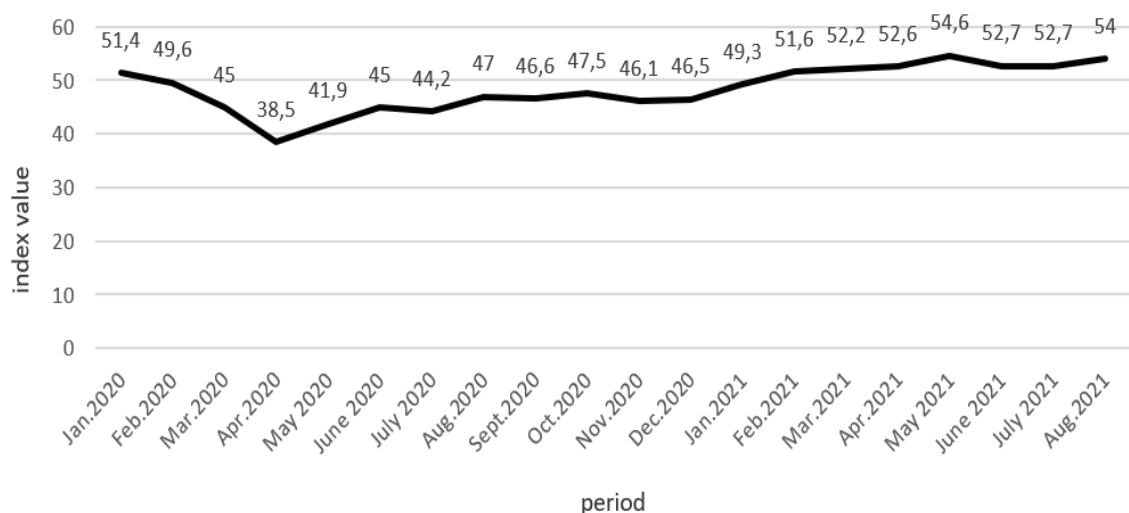


Chart 1. Dynamics of the RSBI index [3].

Considering the socio-economic situation of 2020 and its long-term consequences it should be assumed that the relations between business and government require systemic changes that can create favourable conditions for business development and recovery and the economy as a whole in order to make SMEs a driver of economic growth in the country. Until vaccines become widely available market recovery will continue to rely on sustainable support from monetary and fiscal policies. Adaptive policy stance has eased liquidity tensions, but solvency pressures may reappear soon so far.

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ЭФФЕКТ СТЕКЛЯННОГО ПОТОЛКА В ГЕНДЕРНОМ МЕНЕДЖМЕНТЕ **GLASS CEILING EFFECT IN GENDER MANAGEMENT**

Аннотация. Вопрос гендерного неравенства был и остается актуальным во все времена существования человечества. В данной статье автор рассматривает вопросы гендерного неравенства, которые возникают в сфере бизнеса и управления, рассмотрены факторы и феномены «стеклянного потолка». Автором предложена модель поведения для женщины-менеджера, которая столкнулась с эффектом стеклянного потолка на рабочем месте, а также план действий для формирования гендерной культуры у молодежи в процессе профессиональной подготовки.

Abstract. The issue of gender inequality has been and remains relevant at all times of the existence of humanity. In this article, the author examines the issues of gender inequality that arise in the field of business and management, the factors and phenomena of the «glass ceiling» are considered. The author proposes a model of behavior for a female manager who has encountered the effect of a glass ceiling in the workplace, as well as an action plan for the formation of a gender culture among young people in the process of professional training.

Ключевые слова: гендерный менеджмент, управление, бизнес среда, стеклянный потолок, женщина-менеджер, женщина управленец, гендерная дискриминация, стереотипы, внутренний рынок труда.

Key words: gender management, management, business environment, glass ceiling, woman manager, woman manager, gender discrimination, stereotypes, internal labor market.

The past few decades have shown that the advancement of women is one of the most important levers of international development. Good education of women, their respectable salary, and the ability to manage incomes lead to positive results. We can observe the following tendencies in our society: a decrease of infant mortality, a health gain, an improved nutrition of children, an increase of agricultural productivity, the slowing down of population growth, expanding of economy and decreasing of poverty.

Recently, more and more attention has been paid to gender issues in the spheres of human activity. We can define gender pedagogy, gender psychology, gender policy, and now gender economics and gender management. The need to study gender aspects in the fields of management is associated with the active penetration of women in the management of enterprises, and their participation in the politics and economy of the country. Researchers identify a large number of difficulties that a woman needs to go through on the way of her professional development. Therefore, in foreign gender studies there are a large number of recent works the purpose of which is the identification and analysis of obstacles, which impede the women wishing to build a career [4].

The analysis of researches in the field of gender management showed that almost all women wanting to access the sphere of management faced with the so-called glass ceiling effect. This term was introduced in the early eighties of the 20th century and means an invisible barrier that prevents women from moving up the career ladder. Soon this concept also has received the religious, racial, and age aspects [6]. However, an American sociologist, Professor David A. Kotler [5] together with his colleagues found out that the effect of the glass ceiling is exclusively a gender phenomenon. According to their research, it has become obvious that American women face a glass ceiling while American men do not. Possessing the same or sometimes even better level of professional competence than men, the women stop in career development and do not work at management positions.

Initially this term appeared in the G. Bryant's article in 1984, two years later the term appeared in the article of the American Wall Street Journal. In 1991, the U.S. Department of Labor released an official definition of the term "glass ceiling" stating that it consists of artificial barriers based on behavioral or organizational biases that prevent qualified professionals from moving up the career ladder. Labor Department created a study group in an attempt to level the conditions for career advancement without taking into account the gender [3].

There is an opposite concept of the term "glass ceiling" that is "glass elevator". This term implies the presence of an invisible vehicle that helps men reach the top of the career ladder.

Foreign researchers have tested many observations of the manifestation of the effect of the "glass ceiling". The examples of specific companies show the real size of this problem. The research conducted by a committee under the US Department of Labor showed that 95-97% of top managers of 500 leading companies are men, while 57% of lower-level workers are women and ethnic minorities. This means, that despite the fact that women easily find work in the company as low-paid workers (not managers) and lower-level managers (about 50%), with each subsequent step the number of women decreases to 3-5% at the level of top managers.

American researchers have identified internal barriers of business in the field of gender management. These barriers include:

- the practice of not hiring women;
- a stereotypical idea that a man should be at the head of the enterprise;
- an appointment to positions that are not steps to promotion;
- an appointment to positions that do require reporting to management staff and do not require any liability;
- the lack of mentor and preparation for management;
- the lack of opportunities for career development;
- the lack of access to critical tasks;
- special standards for evaluating performance;
- bias in the rating and testing system;
- the lack of access to informal meetings of the management staff of the enterprise.

Although the manifestation of the "glass ceiling" effect in Russia has not been sufficiently studied at the moment. According to the results of research under the support of the UN, gender stereotypes continue to exist in Russian society, which leads to segregation, in particular, professional segregation. Women in Russia make up 54% of the population, but in the new convocation of the Parliament, there are only 10% of women, and the role in the social and political sphere remains marginal. Women in Russia earn only 70% of the earnings of men in such positions, despite the high

level of qualifications and education, sometimes of even better quality than men. The participation of women in political and management activities is constantly increasing worldwide. Over the past 50 years, 13 countries have had more than one female leader. During 1960–2021, New Zealand and Finland became countries with a rapid rise in women leaders. However, in 119 countries around the world, women were not elected to leadership positions [2].

There are also a number of women's organizations, which are involved into women's affairs. These are:

- “UN women” that protects the status of women, supporting them in economic, political and social rights.
- WEDO Women's Environment and Development Organization. This organization ensures gender equality, economic and social justice. In addition, it is involved into Global Warming Studies and Parenting spirit of leadership in women.
- Women's International League for Peace and Freedom (WILPF). In addition to military conflicts, the organization deals with the problems of violence, discrimination, poverty and pollution;
- Business and Professional Women's Foundation and others [1].

Historically, Russia was one of the first countries where political and social equality of the rights of men and women was officially enshrined after the revolution of 1917. When planning our research, we assumed that the “glass ceiling” is not a typical phenomenon for our country. We believed that in domestic business the women do not experience discrimination, are equal to men, and career restrictions for women are not our reality.

To avoid “Glass ceiling” it is necessary to define your career values. The overwhelming majority of people do not even think what their career values are, what motivates them in their work and career. However, the better a person understands this, the more satisfaction he will receive from professional activity. Without realizing our values, we are doomed to find ourselves in situations, companies and surrounded by people that are alien to us. Without value guidelines, it is impossible to make the right professional choice or evaluate an offer, which leads to being stuck at an unacceptable level for oneself. Working with a career coach and career counselor will help you understand your values.

When career growth is important for the applicant, it is necessary to understand the internal rules of the game and the mechanisms of advancement in the organization before the next career step. This information, most likely, is not specified on the company's website or in open sources. Finding insiders, communicating with industry experts and specialized career professionals forms an understanding of the prospects and helps to make choices when you're going to be employed.

“Glass ceiling” can exist in your head and not be a real obstacle. People often cannot assess themselves as professionals or leaders. They do not understand what value they have for the organization, what requirements they must meet in order to move to the next level. The sooner you understand your level and career goal, the sooner professional changes will begin.

If you work in a company where there is a “glass ceiling” and your professional development has stopped, you do not need to fight against it; this is destructive for all spheres of life. It will not be possible to change the situation, and your time and energy will be wasted.

If you understand that you have run into a career obstacle, choose the optimal strategy for changing employers or developing your business. The presence of barriers to promotion in a company-employer is not always a reason to refuse an offer or rush into the maelstrom of the labour market. Perhaps your status is offset by other advantages. An objective assessment together with a professional career expert will help assess all the pros and cons of the current career situation, show the complete picture and a map of further actions.

Increasing the number of women in government is considered as an unmistakable sign of progress and development of democratic principles. However, in our opinion, the efficiency of the work of this or that establishment will not increase and will not decrease due to changes in the number or even the presence of women in it. It will be important how legitimately a particular candidate was elected outside depending on gender, race, and appearance. From that, not devoid of truth there will

be the opinion that an exceptionally literate woman can act as an adviser and assistant to the monarch, ruler, commander-in-chief or leader. All because women are more inclined to surrender to emotions; they have a stronger feeling of self-preservation, a tough, cold-blooded logic and prudence when making decisions, the one who stands at the large-scale steering wheel.

Economic incentives can gradually change gender roles, improving the quality of life and opening up new opportunities for human talent. The best that society can do now is to encourage positive experiences of economic and political success of women. It is better to think of reducing gender inequality not as an ideological goal in itself, but as a way to meet the existing problems.

To destroy the barriers of the glass ceiling, it is necessary to form the principles of gender equality in all spheres of human life even at the university. When teaching the disciplines of the humanities cycle, it is necessary to take into account the principle of the gender aspect and include them in the work plan:

- to give basic ideas about the subject and specifics of gender studies and priority areas for the development of gender theory, to acquaint with the social, socio-political and scientific theoretical context of the formation of gender studies as a separate scientific discipline;
- to form knowledge about the main stages of development and formation of the theory of gender and the current state of gender discourse;
- to form an idea about the way gender functions in society as a whole and at the level of everyday practices: gender roles, gender stereotypes, gender socialization, gender identity;
- to form an idea about the gender system of society;
- gender relations in the economic, legal and social sphere;
- to give basic ideas about the ways of representing gender culture.

Eliminating gender illiteracy is the first step to be taken in the field of education. Thus, gender education will become a real tool for overcoming the "glass ceiling" effect in the management of organizations of all types.

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ОБРАТНАЯ СТОРОНА ИНФОРМАЦИОННОГО ИЗОБИЛИЯ THE REVERSE SIDE OF INFORMATION ABUNDANCE

Аннотация. Целью проводимого исследования является выявление отличительных характеристик современной информационной среды, формирующих ситуацию информационной перегрузки и информационной зависимости, и проведение анализа их влияния на умственные возможности индивида и на социальные коммуникации. В материале анализируется роль информационных технологий в социальных трансформациях и их влияние на человека с точки зрения нейропсихологии. В статье рассматриваются механизм получения мозгом удовольствия, феномен “схема тела”, способность современного индивида к созданию сложных интеллектуальных объектов и другие психические процессы, и их проявление в условиях современной информационной среды. Делается вывод о необходимости обстоятельного анализа указанных проблем с установкой на нахождение баланса в системе “человек-общество-информация” в сложившейся ситуации информационной среды на современном этапе развития общества.

Abstract. The purpose of the research is to identify the distinctive characteristics of the modern information environment that form the situation of information overload and information dependence, and to analyze their impact on the mental capabilities of the individual and on social communication. The authors analyze the role of information technologies in social transformations and their impact on a person in terms of neuropsychology. The article discusses the mechanism of brain pleasure, the phenomenon of “body scheme”, the ability of a modern individual to create complex intellectual objects and other mental processes, and their manifestation in the modern information environment. The conclusion is made about the need for a thorough analysis of these problems with an attitude to finding a balance in the “man-society-information” system in the current situation of the information environment at the present stage of society development.

Ключевые слова: информация, информационное потребление, Интернет, социальные сети, информационная среда, информационная перегрузка, информационная зависимость.

Key words: information, information consumption, Internet, social networks, information environment, information overload, information dependence.

Most modern people are unable to tell what they want. They seem to have everything to wish for. But for some reason, something is missing. Suddenly, melancholy arises, a feeling of loneliness and meaninglessness of existence rolls over, and a painful feeling of lack of distinct prospects and a decline in strength. To numb all this pain, this inner emptiness, we begin to stuff ourselves with new portions of information content – movies, TV series, shows, news feeds.

Many people believe that the more information we consume, the better. However, this view relies on misunderstanding the mechanics of the human brain. Our brain is prepared by nature for a limited amount of information. Evolution did not prepare us for a hyper-informational environment [2, p. 10].

Nowadays, people constantly hear about such a phenomenon as procrastination, and often they experience it for themselves. In fact, the essence of this phenomenon is the following: a person does not start solving important and urgent matters, but instead solves everyday problems and entertains his brain – by watching movies, by sitting on social networks and so on. In other words, people are very busy gaining pleasure. And now, for a moment, let's forget that humanity is familiar with such a concept as “procrastination” and ask: is it normal that between work and pleasure the human brain chooses pleasure? It is unlikely that such a brain could be considered sick, because a completely normal and healthy brain should act this way.

But what to do with the fact that after another session of procrastination, a person experiences stress, guilt and loss of productivity? In order to better understand this dilemma, there is a need to understand the mechanism of obtaining pleasure as such. What makes human brain have fun? Neuroscientist Wolfram Schultz asked this question. In the course of his experiments, he found out that real pleasure and the natural production of dopamine is caused by the effect of understanding. Wolfram Schultz called the phenomenon he discovered the wow-effect: this is the pleasure of solving some kind of intellectual quest, and not at all the pleasure of actually satisfying a physiological need, as we usually think about it [4, p. 3].

This fact allows taking a new look at the problem of procrastination and the role of social networks in it. Let's imagine a person who spends hours scrolling through the “news feed” on a social network. Time after time he/she comes across some images with inscriptions under it – he/she looks at the picture, reads the inscription and understands what it is about. The puzzle adds up – and the wow-effect works: the same rush of dopamine.

It is worth thinking about what the mass media really is. This is a very technological machine for the production of “wow-effects”: any informational message, Internet meme, movie, TV series is a riddle with a solution. Moreover, no effort is required from people, they do not need to think about something specifically and try to understand, the brain will put the necessary intellectual objects together without the participation of their consciousness.

Information dependence and overload directly affects the quality of various spheres in a person's life.

In a situation when the brain is oversaturated with information, it gets overloaded and turns to a state of anxiety, which leads it to inability to adequately perceive and process the necessary amount of incoming information [2]. To describe this cultural problem, the term “information fatigue syndrome” is increasingly being used. The term was introduced by American neurophysiologist David Lewis in 1996.

In the field of education, this problem manifests itself as the difficulty of obtaining reliable and high-quality knowledge among a variety of heterogeneous and contradictory sources in the learning process. It has also become possible to present the available information as acquired knowledge, which reduces the motivation to self-study and generate new knowledge.

In the personal sphere, there is a complete inability to consciously choose the information consumed, the dependence on the Internet, computer games, television appears. With information saturation, the following mental and physical symptoms manifest themselves: a significant weakening of concentration, aggressiveness towards others, chronic fatigue, stress and related problems [2].

The network method of spreading culture has led to its fragmentation, virtuality serving as a created second reality. In addition, there is a decrease in interest in the essence of things with the

hypertrophy of the meaning of the image, a person moves away from reality. Mass culture is becoming the dominant type of culture.

As for interpersonal relations, there are problems here too. Deep communication between people in real life becomes difficult. Firstly, people's thoughts are occupied with something else entirely, and when they meet other persons, they often do anything but immerse themselves in the process of communicating with them. Secondly, no matter how it may seem at first glance, real communication with people is actually a complex intellectual process. Persons should be focused on the words and actions of their interlocutor in the present, at the same time compare it with his image in their head, maintain a dialogue, and so on. And all these actions require intellectual efforts and brain activity from people. When persons communicate on social networks, they do not communicate with real people, but with their images in their head. Recent studies have shown that people use different areas of the cerebral cortex when they communicate with people online and offline.

Human brain always tries to act on the principle of economy, so when faced with two tasks, it naturally chooses the one that is easier. From the obvious manifestations of this principle: modern people increasingly prefer Instagram or VKontakte to books, since it is clearly easier to perceive images and short captions to them than to focus on a large text [2, p. 7]. In turn, this leads to the fact that mass media, and social networks, in a competitive environment, offer more and more simple content for consumption, while more complex content is being displaced. As the overall level of content decreases, even a seemingly intelligent product actually becomes less intelligent. Only at the place of absolute primitiveness, it seems to be something special. But this does not mean that it really retains its former complexity. If there is less and less complex content, and it is more and more difficult to consume it due to an infinite number of distractions, then soon there will be no complex people.

Flipping through the news feed, it seems to people that they are thinking about something at this moment. But this is only an illusion. Thinking and perceiving information are two different processes. All this leads to the fact that along with the content people consume, their brain is simplified, their thinking is simplified. The very thinking with which people solve all the problems, questions, conflicts what they encounter throughout their lives.

It has already been scientifically proven that people have deteriorated in the ability to create complex intellectual objects. This study was conducted on individuals suffering from schizophrenia. This does not affect its importance and significance in any way: a lot of what we know about health was explained to us by diseases. The fact that schizophrenia has been changing rapidly lately is known to any psychiatrist. O.A. Litvinenko decided to find out the essence of these changes while working on her dissertation under the guidance of Professor, Doctor of Medical Sciences A.N. Alekhine. Access was obtained to archival medical histories of schizophrenics who were born in the 60s - early 70s of the last centuries. The psyche of these people and their ability to intellectual activity was fully formed in the pre-digital era. Now let's analyze the structure of the delirium that their sick brain produces. In general, this nonsense is characterized by incredible complexity and vertical structure. It is detailed and everything in it is connected to everything. But when analyzing the study of schizophrenics born in the 90s, formed by the digital age, we will see that the delirium of modern patients is devoid of any structure. It does not have the same vertical, a single center to which all the threads of the narrative converge. There is also no previous coherence of the elements of delirium [1].

Of course, the content of people's heads depends entirely on the cultures in which we were formed. Therefore, schizophrenics who get sick in different periods of history have different delusional content. But this is not about the content of nonsense. This is about its restructuring – the very way of constructing stories in patients with schizophrenia which was complicated, now has become simple and primitive.

Schizophrenia is an endogenous disease, and it is clear that the neurophysiology and biochemistry of schizophrenia has remained the same as they were thirty years ago. Hence it is worth thinking about why we observe such fundamental changes in the structure of delirium and what has changed in people's lives. What has changed the very way in which the brain of a mentally ill person reconstructs reality?

Apart from the structure of the information environment and the ways of information consumption, nothing has changed. In fact, previously the brains of schizophrenics could create complex structures and powerful intellectual constructions, and with changes in the information environment, this ability simply disappeared. And now it is worth remembering that all modern people are in the same information environment, as well as patients with schizophrenia.

With the advent of the latest information technologies available for free, the problem of delegating thinking has become widespread. There is a phenomenon called the "body scheme" in neurophysiology: the brain continues the size of human body to the limits of the tools human use. This effect is an evolutionary acquisition. And the human brain performs about the same action with intellectual objects.

According to the latest scientific research on human behavior on the web, the following has been established: if persons have access to the Internet and understand how to find the answer to a question in it, then they are sincerely confident that they know the answer themselves.

It is important to understand the following: a person does not think with consciousness, he/she thinks with his/her brain, what is loaded into it. Modern neurophysiological science has proven with complete certainty that person's consciousness copes only with solving very simple tasks; and all serious, complex and important decisions are made by their brain. The brain does it by itself, bypassing consciousness, and sometimes it even does not inform of what it has decided.

When people's brain is faced with a problem and is puzzled, it uses associative connections between different parts of the cortex, trying to find an answer. Like a server, it calculates the information that is stored on it, works out possible options.

The question arises: how can the brain calculate the information that does not exist in it? If it is stored elsewhere – on the Internet, for example - the brain does not perceive it and, accordingly, cannot take it into account. When people delegate their memory to digital media, they do not store in their head those intellectual objects that the brain may need in the future when it encounters some real problem [2, p. 9].

British writer Nico MacDonald, who studies Internet culture, considers information glut to be a consequence of the "Paradigm Underload" phenomenon: that is, society today faces not a question of the amount of information, but the question of developing paradigms that will allow "filtering, prioritizing, structuring and understanding information" [3].

Thus, the main problem nodes associated with the current situation of information overload and general information dependence were identified and demonstrated how they affect the cognitive abilities of individuals and their social and communicative skills. It is hardly possible to argue with the fact that modern information technology is a grandiose invention of mankind, which opens up amazing opportunities for all people. The problem is that people have to learn how to use these opportunities without losing the ability to deal with complex intellectual activities and damaging their social relationships, in other words, find a balance in the "man-society-information" system.

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БАЛАНС ИНТЕРЕСОВ В РОССИЙСКО-КОРЕЙСКОЙ ВНЕШНЕЙ ТОРГОВЛЕ BALANCE OF INTERESTS IN RUSSIAN-KOREAN FOREIGN TRADE

Аннотация. В данной статье рассмотрены торгово-экономические отношения между Россией и Южной Кореей, которая является одним из приоритетных партнеров в Азиатско-Тихоокеанском регионе. Проанализированы товарная и структуры экспорта и импорта каждой из стран, выделены основные направления и тенденции во внешнеэкономической деятельности. Приведены данные об основных направлениях внешней торговли и об основных показателях, таких как экспорт, импорт, товарооборот. Оценены интересы каждой из стран в торгово-экономической деятельности и в условиях дальнейшего сотрудничества. И в качестве заключения рассмотрен вопрос о заключении договора о свободной торговле между Кореей и Россией и его влиянии на торгово-экономические отношения стран.

Abstract. This article examines the trade and economic relations between Russia and South Korea that is one of the priority partners in the Asia-Pacific region. The article analyzes the commodity and country structures of exports and imports of each of the countries as well as highlights the main directions and trends in foreign economic activity. The data on the main directions of foreign trade and on the main indicators, such as exports, imports, trade turnover, are given. The article assesses the interests of each of the countries in trade and economic activities and in terms of further cooperation. In addition, as a conclusion, the issue of concluding a free trade agreement between Korea and Russia and its impact on trade and economic relations between the countries is considered.

Ключевые слова: баланс интересов, внешняя торговля, экспорт, импорт, Южная Корея, Россия.

Key words: balance of interests, foreign trade, export, import, South Korea, Russia.

In the modern world, the sustainable development of the state cannot be achieved without international cooperation and interaction: the globalization of the entire complex of international relations is the most important trend of the world development in the 21st century. Thus, one of the forms of international cooperation is the establishment of trade and economic relations between the countries.

South Korea is interesting for Russia as a trade, economic, scientific and technical partner, primarily in the field of economic development of the regions of Eastern Siberia and the Far East. The Republic of Korea has also successfully made the transition to an export-oriented economy [3, p. 105].

The trade turnover between Russia and South Korea for the period 2016–2020 amounted to 103.1 billion US dollars, and during the entire analyzed period, there was a predominance of exports over imports (Figure 1) [5]. Moreover, the difference between import and export indicators is almost twofold. According to the data of the Federal Customs Service of the Russian Federation in 2020, the trade turnover amounted to 19 603.6 million US dollars [5]. A positive trade balance indicates that there is an influx of foreign currency into the country and, as a result, the exchange rate of the national currency increases [2, p. 247]. Foreign trade relations with the Republic of Korea are mainly in the Sakhalin Region, Primorsky Krai, Moscow, and Khabarovsk Krai, which is primarily due to geographical features – the proximity of the location. The main turnover fell on “Mineral products” (53%), “Transport” (11%) [4]. In the structure of trade turnover by country, China is in first place (16%), Germany is in second place (8%). South Korea is the No. 8 partner for Russia with a 3.5% share [7].

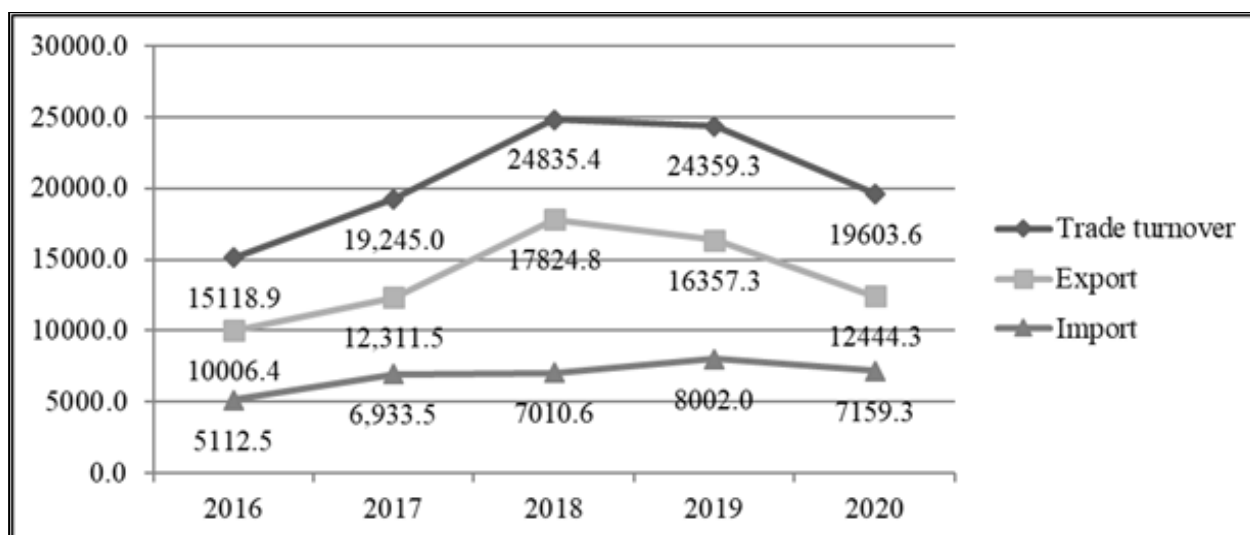


Figure 1. Trade turnover of the Russian Federation and the Republic of Korea for 2016–2020 (compiled by the author based on data from the Federal Customs Service of Russia) [5]

As for exports from the Republic of Korea, the main destinations are China (25.1%), the USA (13.6%), and Vietnam (8.89%). Russia ranks only 16th with a share of 1.43%. Moreover, in the structure of imports, Russia is in 8th place (2.89%), behind China (21.3%), the USA (12.3%) and Japan (9.45%) [6].

If we look at the statistics of South Korea in more detail, we can note the significant dependence of the country on exports and imports, since the indicator of foreign trade as a percentage of GDP for 2020 was 70.1% (Table 1). Moreover, the share of exports (36.9%) is greater than the share of imports (33.2%). In addition, the dynamics of the decline of this indicator in recent years, but it is still more than 70% [8].

Table 1. Indicators of foreign trade of the Republic of Korea for 2016–2020 [8]

Indicators of foreign trade	2016	2017	2018	2019	2020
International trade (in % of GDP)	73.6	77.1	79.0	77.0	70.1

Trade balance (USD million)	116,462	113,593	110,087	79,812	81,945
Imports of goods and services, (in % of GDP)	33.5	36.2	37.3	37.0	33.2
Exports of goods and services, (in % of GDP)	40.1	40.9	41.7	39.9	36.9

Let us also look at the structure of exports and imports of Russian goods to South Korea for 2019–2020 by the main commodity groups that occupy the largest share (Table 2). It is immediately clear that exports and imports of goods in 2020, compared with 2019, have significantly decreased, which may be due to the coronavirus pandemic and, as a result, to a change in the directions and quantity of supplies.

Table 2. Indicators of foreign trade of the Russian Federation and the Republic of Korea by category for 2019–2020 (compiled by the author on the basis of data from the Federal Customs Service of the Russian Federation) [5]

EAEU CN FEA code (The Eurasian Economic Union's Commodity Nomenclature of Foreign Economic Activity)	Export		Import	
	2019	2020	2019	2020
Total:	16 357 200	12 468 101	8 017 701	7 159 386
03 Fish and crustaceans, mollusks and other aquatic invertebrates	1 484 643	1 605 604	8 033	5 574
27 Mineral fuel, oil and products of their distillation; bituminous substances; mineral waxes	13 277 779	9 068 998	90 114	128 539
28 Products of inorganic chemistry; compounds of precious metals, rare earth metals, radioactive elements or isotopes	194 830	263 169	48 872	27 883
30 Pharmaceutical products	21 085	21 558	32 436	101 545
33 Essential oils and resinoids; perfumes, cosmetics or toiletry products	220	474	182 316	171 965
39 Plastics and products made of them	13 607	13 811	562 781	481 309
72 Ferrous metals	342 929	259 429	248 721	241 664
76 Aluminum and its products	281 354	332 552	8 015	8 446
84 Nuclear reactors, boilers, equipment and mechanical devices; their parts	76 469	22 886	1 281 154	1 258 550
85 Electrical machinery and equipment; sound recording and sound reproducing equipment, equipment for recording and reproducing television images and sound	14 823	16 478	946 925	895 158
87 Means of land transport, other than railway or tram rolling stock	695	690	2 273 478	1 519 767
89 Ships, boats and floating structures	4 578	126 516	576 869	750 897
90 Optical, photographic, cinematographic, measuring, control, precision, medical or surgical instruments and apparatus	8 113	7 634	263 052	302 809

Based on the presented data, it can be seen that the largest share in exports to the Republic of Korea is mineral fuel, oil and their distillation products; bituminous substances; mineral waxes – 9,068,998 thousand US dollars, which is more than 70% of total exports to Korea. Also, a large share falls on fish and crustaceans, mollusks and other aquatic invertebrates – 1,605,604 thousand US dollars (12%). Moreover, an even smaller share of exports of ferrous metals, aluminum and products made from it, pearls and precious stones, metals and products made from them, as well as products of inorganic chemistry. Thus, Russia mainly exports raw materials to South Korea [4].

The structure of imports is dominated by two groups at once – means of land transport, except for railway or tram rolling stock (1,519,767 thousand dollars USA or 21%) and nuclear reactors, boilers, equipment and mechanical devices and their parts (1,258,550 thousand dollars USA or 17%). A slightly smaller share is occupied by electric machines and equipment (12%), ships, boats and floating structures (10%) and plastics and products made from them (6%). It should be noted that the economic sanctions imposed by the United States and the EU, as well as the ongoing import substitution programs of the Russian government, have a certain effect on the volume of imports from the Republic of Korea.

In 2020, the import of pharmaceutical products from Korea to our country significantly increased due to the COVID-19 pandemic, which shows how quickly Korea was able to adapt to the changed conditions of foreign trade, enter the Russian market and increase supplies by more than 3 times.

The main goods imported to Russia are products of the manufacturing industry, high-tech equipment with high benefit. The Russian Federation exports raw materials of low benefit to the Republic of Korea [2, p. 250]. This situation is considered by the Korean side as a relatively mutually beneficial trade relationship. Some researchers call it the complementarity of the two countries. Undoubtedly, the Russian side cannot be satisfied with such a state of affairs, but at this stage relations are objectively developing according to the raw materials scenario [1, p. 30].

It is interesting to note that the Republic of Korea has concluded free trade agreements with almost all major trading partners [3, p. 111]. As for the Russian Federation, negotiations on this project have been going on for several years. The development of trade and economic relations between Russia and South Korea is beneficial for each of the parties, for more than thirty years of cooperation between the two countries, a large number of agreements have been concluded that contribute to the development of relations in the economy: agreements on trade, investment guarantees, prevention of double taxation, etc. [1, p. 33]. Therefore, it is expected that the agreement will increase not only trade by reducing tariffs and eliminating non-tariff barriers, but also industrial cooperation by expanding the volume of goods on both sides. The Korean government assumes that the free trade agreement will become a “window” for the realization of Russia's opportunities in the Asia-Pacific region, and for Korea in the Eurasian region.

Thus, in just 30 years of trade and economic cooperation, the Republic of Korea and Russia have developed stable and promising relations, where each of the parties is interested in maintaining stable trade ties and developing new directions in areas of mutual interest. It can be concluded that these two countries have quite a lot of points of contact, both in the structure of exports and imports, which reflect mutual interest in continuing active foreign trade activities in the coming years.

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**РОЛЬ ДЕКАБРИСТОВ В ИСТОРИИ РАЗВИТИЯ
ЛАНДШАФТНОГО ИСКУССТВА ЧИТЫ**
**ROLE OF THE DECEMBRIST IN THE HISTORY OF THE DEVELOPMENT OF
LANDSCAPE ART OF CHITA**

Аннотация. В статье автор рассматривает исторические особенности ландшафтного дизайна городского пространства г. Чита. Материалом исследования послужили опубликованные источники и экспозиционный фонд «Старо-Читинской Михайло-Архангельской церкви (Церковь декабристов)». Сделана попытка показать некоторые аспекты повседневной жизни декабристов в Читинском остроге.

Abstract. Based on the published sources and analysis of the exposition funds of the “Old Chita Mikhailo-Arkhangelsk Church (Decembrist Church)” the author considers the historical features of the landscape design of the Chita urban space. An attempt is made to show some aspects of the daily life of the Decembrists in the Chita prison.

Ключевые слова: декабристы, история, озеленение, ландшафтный дизайн, Чита.

Key words: Decembrists, history, gardening, landscape design, Chita.

The author of this work is studying at the Polytechnic college of Chita in the specialty of secondary vocational education 35.02.12 Garden, park and landscape construction. Therefore, from a professional point of view, the history of the development of landscape art at the regional level (Zabaikalsky region) is of interest. The purpose of the work is to analyze the history of the origin and formation of landscape art in the Trans-Baikal Territory (20–50 years of the XIX century). The author considers the historical features of the landscape design of the Chita, based on published sources and analysis of the exposition funds of the “Old Chita Mikhailo-Arkhangelsk Church (Decembrist Church)” (Chita).

A bright milestone in the history of Chita was the stay in it of the Decembrists – participants of the uprising on Senate Square in St. Petersburg on December, 1825. Little Chita within a short time became known throughout Russia and abroad [2, p. 13].

Zabaikalians learned about the possibility of growing ornamental plants with their own hands on their plots of land with the arrival of the Decembrists, who were engaged in gardening in Chita. Every day, with the exception of holidays, the Decembrists were taken to work.

Decembrist A. Rosen notes that their first job was that they dug a ditch for the foundation of the buildings under construction and a ditch a fathom deep for the stockade. In their free time, the prisoners cultivated a gardening that delivered vegetables for a whole year. And not only were they engaged in gardening themselves, but they also taught the residents of Chita to grow plants unknown to those. In 1827, on the territory of the Chita prison, they were allowed to arrange the first small garden, in which beautiful alleys were laid out, flower beds were planted and even a sundial was built [2, p. 96]. Further gardens were laid out in the prison yards of Chita and Petrovsky Zavod.

In 1828, the Decembrists established a connection with the St. Petersburg Botanical Garden and personally with its director F. Fischer, which contributed to obtaining seeds of various plants (including ornamental ones) from the European part of Russia.

In the 20s of the XIX century, as N. Zakoblukovskaya notes, public gardens for festivities began to be created in Eastern Siberia [1]. They were considered by the city government as a necessary element of the improvement of the city. During this period (1827–1828), the Decembrists laid the first city garden of Chita for the commandant of the Chita prison, S. Leparsky. This garden was located around the old lake (the so-called Bath Lake), not far from the riverbed of the Chita River, on its high steep bank. In the town garden alleys were laid, a gazebo was built, wooden benches and statues were installed, wild ornamental trees and shrubs were planted, flower beds were arranged.

Many of the Decembrists were engaged in natural history observations in Chita. Among them is the passionate naturalist P. Borisov. The data of meteorological observations that P. Borisov conducted in Chita are located in the Federal State Budgetary Institution “Voeikov Main Geophysical Observatory” [1].

He mastered the skills of watercolor painting. Drawings by P. Borisov conducted research on geography, biology of plants and animals, the images of living objects in his drawings are distinguished by scientific accuracy.

Dmitry Zavalishin is a Russian officer, publicist and memoirist. He being on the settlement in Chita (since 1839), he created an exemplary farm with a vegetable garden, a garden and the first Trans-Baikal greenhouse in the floodplain of the Chita River on the site of the swamps drained by him (now the area of urban sewage treatment plants). There were about 600 plants in greenhouse conditions, including lemon trees, roses, cypresses and others. In addition, he arranged an apothecary's garden with medicinal herbs [2, p. 107].

The “wonderful experiments” of the Decembrists with plants began to arouse interest among local enterprising merchants. Consequently, in the Trans-Baikal Territory, the Decembrist D.I. Zavalishin can be considered the founder of garden art. In Chita, he created an exemplary farm in which raspberries, currants, watermelons, and Virginia tobacco grew.

P. Falenberg is a memoirist, Decembrist, lieutenant colonel of the quartermaster unit. He made tools for topographic survey of Chita together with N. Bestuzhev. Thanks to this, in 1830, the Chita plan was removed, which is a valuable historical document that gives an idea of the size and location of this village. On a scale of 50 fathoms in one English inch, the plan was published thirty years later. The Museum of the Decembrists of Chita has a copy of this plan. If you look closely, you can count about 50 houses and buildings grouped mainly around the church.

Chita occupies a special place in the life of the Decembrists. This town has entered their lives forever. In the casemates, the Decembrists managed to develop forms of versatile activity. Numerous documents, paintings, personal belongings, presented in the Chita Museum, acquaint with the activities of the Decembrists, their stay in hard labor.

The nature of the Russian park buildings of the XIX century: 1) large-scale solutions to the problem of space, the nature of the region, and the reflection of the characteristic features; 2) close connection with the landscape chronicle; 3) introduction of the landscape in separate territories; 4) flower arrangements are made by the four ornamental flower beds, gravitating to the courtyard or park buildings.

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ГРУЗОВЫЕ ОПЕРАЦИИ И ИХ ЗНАЧЕНИЕ В МИРОВОЙ ЭКОНОМИКЕ CARGO OPERATIONS AND THEIR SIGNIFICANCE IN THE WORLD ECONOMY

Аннотация. В статье говорится о судоходстве как связующем звене мировой экономики: без судоходства, интерконтинентальная торговля, грузовые перевозки сырых материалов, импорт и экспорт доступных продуктов и товаров не были бы возможны. Автор

представляет преимущества морской грузоперевозки, а также анализирует причины, почему экономика не могла бы функционировать, если бы не было судов и судоходной отрасли.

Abstract. The article considers shipping as the connecting link of the world economy: without shipping, intercontinental trade, cargo transportation of raw materials, import and export of affordable products and goods would not be possible. The author presents the advantages of sea cargo transportation, and also analyzes the reasons why the economy could not function if there were no ships and the shipping industry.

Ключевые слова: морские перевозки, перевозка грузов, морской транспорт, мировая экономика, эпидемиологическая ситуация.

Key words: sea transportation, cargo transportation, maritime transport, world economy, pandemic situation.

Nowadays cargo transportation by sea plays a huge role in global merchandise. At the beginning of 2020, the total world fleet amounted to 98,140 commercial ships of 100 gross tons and above, equivalent to a capacity of 2.06 billion deadweight [5]. The international shipping industry plays a great role in the world foreign trade. Marine cargo turnover accounts for 62% of foreign trade traffic in the world and undoubtedly plays an important role in the global economy [2]. For centuries of history, shipping has grown from expeditions and small local sea cargo transportation into a connecting link of the economy, in a huge industry. Without it, the import and export of available products and goods would simply not be possible. Hundreds of years later, due to the development of maritime transport, the ocean began to connect countries and continents, rather than divide them.

Sea transportation was successfully used by the Romans and Greeks in ancient history and it is actual to our days. International trade began to develop intensively in the Age of Discovery. It was closely related to the development of shipbuilding, the invention and use of such instruments as the magnetic compass and the astrolabe. States that took full advantage of sea transportation began to dominate in the world economy and politics. In the beginning, it was Spain and Portugal, then the Netherlands, but at the end of the 17th century, England became the first in Europe and the world, which maintained its monopoly until the 20th century. International maritime transportation has extensive geographical coverage since more than half of the countries in the world have access to the sea.

Russia is a country whose territory is washed by the waters of three of the four world oceans: The Pacific, Atlantic and Arctic. The length of the sea borders of Russia is significantly greater than the land borders (39.4 thousand km of sea borders and only 22.3 thousand km of land borders [4]), which accentuate the importance of maritime communications for the development of trade and ensuring stable growth of the country's economy. But it is impossible to achieve this goal without the development of maritime transport and coastal infrastructure based on the achievements of science and technology, expanding the geography of internal and external transportation. Therefore, sea transport, which is connecting Russia with other states – subjects of the world economy, should become one of the priority sectors of the Russian economy. The development of this industry will help Russia take a worthy place in the world economy; therefore, the topic of this article is extremely important for the development of the economy of our country.

The main reasons for the popularization of sea transportation are their main advantages:

1. Low cost of transportation. Compared with air, pipeline, railway and automobile types of transportation, sea transportation by ship is characterized by a lower cost. This is due to the fact the sea transport needs much less energy and, accordingly, fuel.

The construction of large specialized vessels, the use of the latest technological advances, including for the organization of loading and unloading operations in ports, in recent years has reduced the share of transportation in the final price of goods from 11% to 2%. Construction of large-

tonnage vessels gives a "scale effect": the greater the ship's carrying capacity, the cheaper the delivery of a unit of goods.

2. Large lifting capacity, which allows transporting a significant amount of merchandise. Modern bulk carriers and tankers are very large and capable of carrying a weight of 200-300 thousand tons.

The largest supertanker was Knock Nevis built in 1979. This vessel had a deadweight of 564763 tons, which is 658362 m³ (4.1 million barrels) of oil [7]. However, later, in 2010, it was disposed of, because due to its large size and draft, it could not pass such channels as Suez and Panama, as well as the English Channel.

3. The practical absence of restrictions on the dimensions of the cargo and the capacity of sea transport. Even if the port parameters (for example, depth) do not allow a large-tonnage vessel to approach the shore, modern technologies for transshipment of goods on the high seas or on the roadstead are used.

4. There are practically no bandwidth limits. The development of maritime transport has led to the construction of new ports, construction of sea channels, development of port facilities etc. Consequently, this allowed expanding the bandwidth and the number of vessels that can be handled in ports.

5. The possibility of using it where other delivery options are not possible. Large-scale cargo delivery to some areas is possible only by sea. As an example – Arctic regions of Russia – Chukotka, Kamchatka;

There are also underdeveloped countries and small countries where there are practically no airports. In this case, sea transportation is the only delivery option, because ports in these countries will be more common than airports. For example:

Monaco does not have an airport but at the disposal of this principality, there are two seaports.

6. Minimal risk of damage to the goods. In general, in the world, losses from shipping by sea are only 1 - 1.5% of the cost of goods. Maritime transport has the lowest share of disasters and accidents [2].

The database of Allianz Global Corporate & Specialty (AGCS) shows 49 total losses of vessels over 100GT at the end of 2020 around the world. In 2018, the world fleet lost 53 vessels. This is almost half as much as in 2017 – 95 vessels, and 55% less than the average for the last ten years – 104 vessels [6]. The loss of vessels and as a consequence the loss of cargo is decreasing every year. A more professional level of knowledge of the crew and improved technical equipment of the vessels have a direct impact on reducing collisions and shipwrecks.

Companies that don't want to incur huge losses of money hire trained and competent stevedores (people employed by the port authorities or a company engaged to load or unload cargo from ships) and tallyman (a person who tallies, checks, or keeps an account or record during loading and discharging) to avoid further damage and shortage of cargo.

Such checks during the cargo operations, as well as the tendency of reducing collisions, guarantee minimal risk of damage to the goods. This means the cargo will be delivered in integrity and safety.

7. A single legal field with a 400-year history of development. People taught by the stories of shipwrecks, a collision of the vessels, and pollution of the sea and so on made a number of documents to prevent such cases.

The International Maritime Organization is an international organization mandated to regulate and govern maritime affairs at the global level.

The United Nations Convention on the Law of the Sea (UNCLOS), also called the Law of the Sea Convention or the Law of the Sea Treaty, is an international agreement that establishes a legal framework for all marine and maritime activities. All other conventions created tend to complement UNCLOS.

8. Sea transport has no alternative for transcontinental transportation.

As for intercontinental transportation, sea transportation has practically no analogues. It is expensive to transport cargo by plane, and mainly only oil and gas can be transported through the pipeline.

Vessels provide 98% of the foreign trade of Japan and the UK, more than 90% – the USA [2].

In Russia, the volume of cargo transportation by sea annually increases by 6–7%. Half of the customs payments go to the budget of the Russian Federation from the ports [2]. One of the priorities in the development of shipping in Russia is the Asia-Pacific region. The development of countries in the Asia-Pacific region is one of the most dynamic elements of integration processes. International cooperation in the Asia-Pacific region is becoming an important factor in the economic development of both the region and the entire world economy.

Summarizing all the advantages cargo delivery by sea is characterized by its versatility, reliability and low price. This method of transportation is chosen to reduce the cost of cargo transportation. Sea transport is especially effective when transporting large volumes.

In comparison to the above advantages, disadvantages such as dependence on weather conditions; low speed in comparison with other modes of transport; technological difficulties of the loading and discharging complex; will not cover all the advantages. Moreover, all drawbacks are actively eliminated and this area of cargo transportation is developing every day.

Maritime transport plays an important role as a material factor in the development of the international division of labor, which causes the growth of world production and commodity exchange between States. Therefore, it is quite natural for each country to tend to carry out transportation on its own vessels in the interests of ensuring the independence of foreign trade from foreign tonnage and freight market conditions. The development of national fleets allows not only to save currency on the freight of vessels, but also to export sea transport services and receive significant income in foreign currency, which in turn contribute to an increase in imports and the development of international trade.

It is important to note that transport production has no real form. It doesn't produce any new items. The shipment is the way to transits goods and products created in other sectors of the economy. The most common goods transported via shipping are bulk cargoes, such as construction materials, crops, minerals, as well as liquid cargo, container cargo and much more.

Modern sea transport can transport almost any type of cargo – liquid, solid, bulk, fragile, etc. Special vessels have been created for the transportation of certain types of cargo – tankers, lighters, refrigerators, RO-RO, LO-RO, OBO, VLCC, ULCC and many others. There is practically no cargo that could not be delivered by ships by sea.

Even perishable cargo can be transported by the reefer vessels. A reefer ship is a refrigerated cargo vessel, which is typically used to transport perishable cargo, which require temperature-controlled handling, such as fruits, meat, dairy products, vegetables etc. A major use of refrigerated cargo hold type ships was for the transportation of bananas and frozen meat, but most of these ships have been partly replaced by refrigerated containers that have a refrigeration system attached to the rear end of the container.

A characteristic feature of the modern development of international maritime transport is that the participation of developing countries in them is increasingly increasing, the percentage of whose merchant fleet in world tonnage has exceeded 15%. The mechanism of the impact of shipping on the global economic situation has been studied in some detail: factors such as the level of freight rates, technical and economic indicators and the nature of shipping services directly affect the pace of economic growth and stability of the global economy and can have a serious impact on the development conditions of individual states, as well as entire regions. In addition, the level of development of shipping is directly related to the economic growth of many States, and for some countries it is the most important source of national income.

The current pandemic situation has led to an expected decrease in the volume of shipping containers, as well as other types of cargo, and interruptions in shipments. The most noticeable decrease in the number of shipments was in February 2020, at the height of the epidemic in China.

In March 2020, some carriers are seeing an increase in the number of shipments from Europe. Nevertheless, the disease has negatively affected the operation of terminals in the USA and EU countries.

Thus, according to the analytical online service “SeaNews” [1], in February 2020, the container turnover of the Baltic Basin ports, the largest in terms of container turnover in Russia, decreased by 6.1% compared to February 2019. Exports decreased by 2.9%, imports - by 9%. This is a consequence of the outbreak of the epidemic in China during this period [3].

On the other hand, the pandemic affected all types of transportation. And over time, the cost of transportation will gradually decrease along with the resolution of the epidemiological situation

The COVID-19 pandemic is a litmus test, not only for globalization but for global solidarity and collaboration as well. The success of the above-mentioned policy measures will depend on effective international collaboration to ensure coordinated policy responses. Coordinated efforts are also necessary for the standardization of data, tracking of port performance and development of protection mechanisms against cybercrime. In facing the challenges ahead, policymakers should ensure that financial support, technical cooperation and capacity-building are provided to developing countries, in particular the most vulnerable groups of countries, including the least developed countries, landlocked developing countries and small island developing States.

After the pandemic, the logistics world will not be the same as before. But companies that follow trends and quickly adapt to changing circumstances will be able to manage the situation, create in-demand services and strengthen their positions in business. What is especially important, a common misfortune united and united the logistics industry. In the context of the global economy emerging from the “pandemic peak”, it is the collaboration of logistics companies that can become one of the most important and effective drivers of subsequent development and growth.

Summing up, cargo operations remain the most cost-effective types of transportation, which is confirmed by all the advantages listed above. However, factors such as the world pandemic make their own adjustments and force to prepare new algorithms of actions so as not to damage the economics of countries. In the future, we consider it expedient to analyze and summarize the experience of advanced maritime powers regarding the stabilization of cargo transportation during an unfavorable epidemiological situation and propose the best option for use in domestic shipping.

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**РЫНОК ТРУДА ВЕЛИКОБРИТАНИИ: ТЕНДЕНЦИЯ РОСТА СПРОСА НА
ВЫСОКОКВАЛИФИЦИРОВАННУЮ РАБОЧУЮ СИЛУ
THE UK LABOUR MARKET: THE TREND OF GROWTH IN DEMAND FOR HIGHLY
SKILLED LABOUR FORCE**

Аннотация. В данной статье рассмотрены современные тенденции развития рынка труда Великобритании, как одной из лидеров-стран с процветающей экономикой. Главным аспектом анализа выступает спрос на высококвалифицированную силу, в том числе вопрос о привлечении иностранной рабочей силы. Также проведен анализ по основным показателям, характеризующим рынок труда: уровень безработицы, уровень занятости населения, рост заработной платы, минимальная заработная плата, реальный прожиточный минимум, зарплата высококвалифицированных работников и т.д. Отмечается факт противоречивости тенденций, связанных с делением рынка труда на сектор высококвалифицированной и низкоквалифицированной рабочей силы. Анализ показал, что ужесточённый контроль иммиграции рабочей силы в Великобританию затрудняет въезд низкоквалифицированным рабочим и продолжается рост дефицита низкоквалифицированной рабочей силы внутри страны за счёт стимулирования сектора высококвалифицированной рабочей силы и перехода большей части населения на гибкий график работы или фриланс.

Abstract. This article examines the current trends in the development of the UK labour market as one of the leaders-countries with a thriving economy. The main aspect of the analysis is the demand for highly qualified labour, including the issue of attracting foreign labour. The analysis was carried out based on the main labour market indicators: the unemployment rate, the level of employment, wage growth, minimum wage, real living wage, salary of highly qualified workers, etc. The fact of contradictory trends related to the division of the labour market into the sector of highly skilled and low-skilled labor has been determined. The analysis revealed that the tightened control of labour immigration to the UK makes it difficult for low-skilled workers to enter. And the shortage of low-

skilled labour continues to grow within the country due to the stimulation of the highly skilled labour sector and the transition of a large part of the population to a flexible work schedule or freelance.

Ключевые слова: рынок труда, высококвалифицированная рабочая сила, гибкий график работы, уровень безработицы, спрос на труд, трудоустройство.

Key words: labour market, highly skilled labour force, flexible work schedule, unemployment rate, labour demand, employment.

The labour market is one of the main elements of the economy, which ensures the distribution and redistribution of the economically active population and directly controls and regulates the expedient and conscious human activity aimed at meeting the individual needs and society, that is labour.

The labour market is a multi-complex mechanism that addresses issues and problems related to:

1. Labour demand and labour supply
2. Features and structure of different types of labour markets
3. Studying the competitive environment in the labour market
4. Infrastructure

These categories represent an integral basis for analyzing labour markets and considering the topic of the labour market in the UK: trends in the growth of demand for highly skilled labour. The relevance of the topic is due to the need for a qualitative and quantitative study of the volume of public labour needs for the “healthy” functioning of the labour market and, consequently, the positive dynamics of the economic and social development of Great Britain.

Let's start with a general review of the main indicators of the UK labour market to identify some trends.

Table 1. Key indicators of the UK labour market [1]

Indicator	Value	Period
Minimum wage	1967.132 USD/month	2021
Unemployment rate	3.9 %	August 2019
Youth unemployment	13.5 %	April 2021
Level of employment	75.9 %	Q2 2019
Level of economic activity	79 %	July 2019
Real living wage	1102.991 USD/month	2018
Wage growth	3.8 %	August 2019
Salary of highly qualified employees	2871.474 USD/month	2018
Salary of low-skilled workers	1626.758 USD/month	2018

Analyzing the data of the indicators presented in Table 1, we can conclude that the UK is a highly economically developed country with a high level of wage, a high level of economic activity (79%) and a low unemployment rate (3.9%). And, in principle, this is not surprising, because employment in the UK is the dream of many local and foreign specialists, since it is one of the most prosperous countries in the world with a reliable social security system and other incentives. And, considering the average salary of highly qualified workers (2871.474 USD/month; in comparison with Russia, where this indicator is 687.276 USD/month in 2018, which is several times less), we can conclude that the UK has highly qualified specialists to enter its labour market.

Given the analysis of the UK labour market I would like to identify one of the main current trends: the growing demand for highly qualified labour and the attraction of highly qualified specialists from abroad (immigration of professionals). And actually, this trend suggests considering

a new system for issuing visas for work and study in the country "The best minds from around the world" from February 2020 aimed at:

1. Reducing the flow of low-skilled labour
2. Reducing the shortage of highly skilled labour

Table 2. Criteria for the selection of foreign specialists [3]

Requirements	Points
Knowledge of English (required)	10
Job offer, business offer or sponsor (less stringent requirements for highly qualified professionals)	20
Required level of qualification for the job (required)	20
Salary from £20,480 to £23,039 (there are reservations for individual professionals)	0
Salary from £23,040 to £25,599	10
Salary from £25,600	20
Work from the list of scarce professions	20
Availability of a degree from the applicant	10
Having a degree in science, technology, engineering or mathematics	20

Table 2 shows the result of borrowing a point system from Australia to make a decision on the immigration of specialists who must score at least 70 points according to the conditions of the employment program in the UK. It is precisely the criteria that ensure stricter selection of qualified workers and, thereby, finding the best specialists immigrating to the UK. The begging of January 2021 to come to work in the UK applicants must meet strict criteria and have an invitation to work from a British company.

However, this new system with positive prospects also generates a negative trend in the UK labour market: the development of a shortage of low-skilled labour (highly qualified specialists tend to the UK, and low-skilled leave it). There is a rather contradictory situation, where, on the one hand, the UK government directs forces to abandon cheap, low-skilled labour of immigrants to the country (for example, migration policy after Brexit), on the other hand, it fears a shortage of common workers. The outflow of labour is indicated by the growth of people emigration from the country (the data are presented in Table 3). The indicator increased in the period from 2016 to 2020 by 60 thousand people.

Table 3. Emigration from the UK [2]

Year	Emigrating from the UK, thousands of people
2016	342
2017	374
2018	392
2019	393
2020	403

Having mentioned the problem of the shortage of low-skilled labour, we would like to consider another trend that is directly related to this issue: active implementation of the flexible work schedule format. In 2014, the right of employees to a flexible schedule was fixed at the legislative level, which motivated employees to switch to a flexible schedule and freelancing system (the problem of the need for low-skilled labour has also worsened due to this factor). The relationship between a flexible schedule and the financial profit of companies is noted by 63% of British

managers. The trend of switching to a flexible schedule is developing that is supported by the results of a social survey: "Why is freelancing and flexible schedule attractive?":

1. flexible work schedule (self-allocation of time) (35%) – the key point
2. improving the balance between work and private life (11%)
3. increasing the possibility of developing oneself as a person – a human psychological factor (10%)

The UK labour market has shown rather contradictory trends. In fact, the UK is an attractive country for highly qualified foreign specialists with a positively progressive dynamics of the main indicators of the labour market: unemployment, minimum wage, social security in employment, the possibility of switching to a flexible work schedule when providing the necessary justifications. However, with such an idealized picture, control over the situation in the low-skilled labour sector is lost that cause a shortage of workers in mundane professions.

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ЭКОЛОГИЧЕСКАЯ БЕЗОПАСНОСТЬ НА МОРСКИХ СУДАХ ENVIRONMENTAL SAFETY ON SEA VESSELS

Аннотация. В данной статье рассматривается проблема экологичности морского транспорта. В работе идет речь о негативном воздействии морского судоходства на окружающую среду и о видах загрязнения с судов. Большое внимание уделено конвенции,

которая предусматривает комплекс мер по предотвращению загрязнения моря судами (MARPOL).

Abstract. This paper deals with the problem of environmental friendliness of maritime transport. The article is about the negative impact of maritime shipping on the sea environment and the types of pollution from ships. Much attention is given to the convention, which provides a set of measures to prevent marine pollution from the ships (MARPOL).

Ключевые слова: экология, окружающая среда, океан, морской транспорт, загрязнение воды, конвенция.

Key words: ecology, environmental, ocean, maritime transport, water pollution, convention.

The issue of ecology and preservation of the environment is a pressing one in the world at present. Undoubtedly, this topic is extremely relevant for maritime transport, because sea transportation generates negative impacts on the marine environment, including air pollution, greenhouse gas emissions, releases of ballast water, oil and chemical spills, dry bulk cargo releases, garbage, underwater noise pollution

In this article we discuss the state of the world's oceans at the current time, what regulations are being adopted by the maritime community to reduce pollution of ocean waters, and also discuss what additional measures could be introduced to ensure the environmental safety of the marine environment.

Uncontrolled impact on the sea depths leads to global problems due to pollution of the World Ocean. Many species of flora and fauna are on the verge of extinction. But the negative process is just accelerating. It is already at such a stage that in 40–50 years there would not be any seafood. The excessive carbon dioxide saturation of water leads to oxidation, a lack of oxygen and the destruction of the inhabitants of the sea depths.

- Let us consider the major sources of pollution:
- Industrial and household waste – pesticides, chemicals.
- Burial on the seabed of toxic substances – radioactive waste.
- Leaks of ship transport – oil, oil products.
- Pipeline breakdowns – gas, oil.
- Development of minerals at the bottom – heavy metals.
- Pollution from ships – ballast water, wastewater, garbage, dangerous goods. But this list is not complete, and new issues may be added to it every day.

It is evident that the civilized international community does not idly wait and attempts to take all possible measures to protect and save the marine environment. And one of them is MARPOL. It is a well-known legal document providing for measures to reduce and prevent pollution of the marine environment with harmful substances.

MARPOL is the main international convention aimed at the prevention of pollution from ships caused by operational or accidental causes. It was adopted at the International Maritime Organization (IMO) in 1973. The Protocol of 1978 was adopted in response to a number of tanker accidents in 1976–1977. The 1978 Protocol was absorbed into the parent Convention and the combined instrument entered into force in 1983 [2].

The goal of MARPOL is to establish international standards to prevent pollution of the marine environment from ships by harmful substances, as well as introducing special areas [3].

The introduction of special areas was driven by one of two factors:

- Excessive pollution of the area, to prevent further deterioration of the ecological situation.
- Preservation of ecologically clean areas of the sea ocean.

Control and responsibility for compliance with the requirements of IC MARPOL are assigned to the flag states and port states.

Flag States are required to ensure that flagged vessels comply with MARPOL requirements. To prove their fulfillment, certificates of conformity with the requirements of the Convention are provided, which are issued by the Flag Administration.

The Port States have the right to inspect ships flying the flags of other States, especially if there are clear grounds that the ship is not complying with the requirements of the Convention. This procedure is called Port State Control (PSC).

The captain and officers of the vessel, as well as the entire crew in accordance with their official duties, are responsible for the application of MARPOL requirements on board.

MARPOL sets limits for the discharge of harmful substances into the atmosphere and the ocean, but at present, many shipowners, companies, and crews of ships do not adhere to these rules in the open waters, so there is still pollution of water space. To reduce the negative impact of the ship crew on the marine ecology, it is necessary to introduce control directly over each vessel. That's why we think that International Maritime Organization should create the position of an ecological agent on the ship.

It is significant to add that the actual situation related with the Covid-19 pandemic particularly influence the marine ecology. Some 8.4 million tonnes of plastic waste have been generated in 193 countries since the pandemic began. The scientists from Nanjing University states that "the Covid-19 pandemic has led to increased demand for single-use plastics, adding pressure to the already uncontrollable global plastic waste problem" [1].

The International Maritime Organization and the entire international community is concerned about the environment, and every year new restrictions are introduced, for example, from January 2020 shipowners had to abandon the use of high sulfur fuel, as a new IMO standard to reduce sulfur content in fuel from 3.5% to 0.5% came into force. Standards for sorting waste onboard ships ban dumping waste, hazardous substances, and so on. But as we said, all these standards are set out on paper and, in reality, the global community does not have enough resources to control all the processes in shipping.

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**ПРИЧИНЫ РОСТА ЦЕН НА ЖИЛУЮ НЕДВИЖИМОСТЬ
В МОСКВЕ В ПЕРИОД ПАНДЕМИИ COVID-19
REASONS FOR GROWTH OF PRICES FOR RESIDENTIAL REAL ESTATE IN
MOSCOW DURING THE COVID-19 PANDEMIC**

Аннотация. Пандемия оказала воздействие на все сферы жизни общества. Россия, как и другие страны мира, столкнулась впервые с вызовами пандемии, кардинально повлиявшими на экономику страны. Трансформация рынка недвижимости в столице РФ стала одним из самых заметных экономических изменений в период пандемии. Экономические меры, принятые правительством России в период пандемии, стали одновременно как фактором поддержки населения, так и фактором увеличения спроса на недвижимость, с последующим увеличением цен на нее. В своем исследовании автор описывает причины изменения цен на жилую недвижимость в Москве, представляет количественные и процентные показатели, а также дает прогностическую оценку изменения цен, основываясь на анализе научной литературы и данных консалтинговых компаний.

Abstract. All spheres of society have been affected by the COVID-19 pandemic. Russia, like other countries of the world, faced the challenges of the pandemic for the first time which had a profound impact on the country's economy. The transformation of the real estate market in the capital of the Russian Federation has become one of the most noticeable economic changes during the pandemic. The economic measures taken by the Russian government during the pandemic have become both a factor of support for the population and a factor of increasing demand for real estate, with a subsequent increase in prices for it. The author describes the reasons for changes in prices for residential real estate in Moscow, presents quantitative and percentage indicators, gives a prognostic assessment of price changes based on the analysis of scientific literature and consulting companies' data in this research.

Ключевые слова: недвижимость, жилая недвижимость, COVID-19.

Key words: real estate, residential real estate, COVID-19.

All major spheres of society have been changed and affected by the coronavirus pandemic. The real estate market is not an exception. The basic situation of the Russian real estate market before the pandemic was largely determined by the beginning of the mass transition of shared-equity construction to project financing using escrow accounts. It led to the following consequences:

- slowdown of projects implementation;
- reduction of real estate commission;
- reduction of primary market supply;
- increase in average offer prices.

The decree passed by the Russian Government on the 24th of 2020 allows obtaining a mortgage of 6.5% [1]. This is a completely new type of state support. A drastic increase in consumer demand for real estate during the crisis (using mortgage mainly) would have been impossible without the soft monetary policy of the Bank of Russia. At the beginning of 2020, the mortgage rate was 6.25% per annum, dropping to 4.25% by the end of the year. However, negative real mortgage rates have become a much more significant factor in the real estate market. It is obvious that taking out a real estate loan (a mortgage) at a rate of 6–8% when an increase in real estate prices is 15–20% becomes an extremely profitable operation. The issuance of mortgage loans was about 4.3 trillion rubles in 2020. The percentage of concessional loans was more than 30% of this sum. According to analysts, the main consequences of increase in the cost of real estate market are as follows:

- quantitative easing;
- launch of the preferential mortgage program;
- implementation of tax on income from bank deposits.

Developers also had new opportunities during the pandemic:

- possibility of opening of credit and escrow accounts;
- setting-up personal shareholder account;
- implementation of electronic document management of the shareholder and the developer;
- possibility of placement and editing of the project declaration with unloading at www.дом.рф;
- electronic formation of the equity participation agreements (EPA).

Russia took the ninth place in the world rankings of housing appreciation according to the results of the first quarter of 2021. Prices have increased up to 11%. This indicator allowed Russia to overtake the UK, Norway and Canada. The cost of secondary housing in Moscow increased by 17%. The average cost of apartments in the primary real estate market in the old borders of Moscow increased by 24%. The average price per square meter in Moscow reached 405.8 thousand rubles. The prices for business class housing increased by 11.4%, for the elite segment – by 9.7%, for mass housing by 7.6%. Meanwhile, the total area of the offer has updated the five-year minimum and has made up 1.86 million square meters [2]. Studios and one room flat apartments of economy or comfort classes are always in high demand during the crisis period. However, the consumers' greatest interest is expressed to family-type apartments or to a higher class of real estate. This is closely connected to the attractive conditions of mortgage programs for the purchase of new housing.

The extraordinary nature of the crisis in 2020 corrected the logic of cyclical movement of real estate prices. Real estate prices always rise during the economic recovery. Subsequently they gradually decrease after passing the acute phase of the crisis [4]. To sum up, despite the extension of the preferential mortgage program, it will be more difficult to maintain subsidizing of the real estate demand at the same volume.

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ФРАНЦИЯ КАК «ОСНОВОПОЛОЖНИК» ПРАВ ЧЕЛОВЕКА В ЕВРОПЕ FRANCE AS THE “FOUNDER” OF HUMAN RIGHTS IN EUROPE

Аннотация. В статье рассматривается процесс становления и развития прав и свобод человека и гражданина во Франции. Являясь одной из основоположников прав человека в Европе, Франция создала правовой прецедент для дальнейшего развития системы прав человека в мире. В работе проведен анализ прав и свобод человека. В каждом последующем рассмотренном этапе наблюдается усовершенствование прав человека и соответствующая защита прав личности. Особое внимание уделено активному участию Франции в разработке новых правовых норм в области защиты прав человека и гражданина, что служит примером для остальных стран и способствует повышению качества защиты прав и свобод человека и гражданина не только во Франции, но и во всем мире.

Abstract. The article investigates the process of formation and development of human and civil rights and freedoms in France. Being one of the founders of human rights in Europe, France has created a legal precedent for the further development of the human rights system within the world. The analysis of human rights and freedoms is carried out within the present article. In each subsequent stage considered there is an improvement towards human rights and the corresponding protection of individual rights. Special attention is paid to the active participation of France in the development of new legal norms in the sphere of human and civil rights protection which serves as the example for other countries and contributes to the improvement of the quality protection of human and civil rights and freedoms not only in France but throughout the world.

Ключевые слова: права человека, конституция, мигранты, закон, резолюции, Франция, Европейский союз.

Key words: human rights, constitution, migrants, law, resolutions, France, European Union.

Human and civil rights and freedoms are widely covered and investigated topic of nowadays. The consolidation and clarification of the majority of provisions concerning the legal status of a person as a person and a citizen are leading to a better understanding of social and legal relations within society as a whole. One of the leading directions of the modern countries is the policy of regulating human rights. France is the most practical in this area. For France, human rights have a special historical significance.

It should be noted that the process of establishing human rights in France took place in several stages. At the first stage, general concepts of human rights were formed and set out in the Declaration of Human and Civil Rights in 1789. France was one of the first States to declare human rights equal and inalienable by means of adoption of the above-mentioned Declaration. This declaration was adopted at the time of significant sociopolitical crisis associated with the poor distribution of budget funds by the French royal dynasty as well as almost complete disregard for the rights of unprivileged citizens. The Declaration legally established the status of any newly born person as equal to others while it was pointed out that social segregation is not a reason for ignoring equality and could only be applied for the common welfare. In addition, the Declaration became the foundation for the formation of subsequent Constitutions [5, p. 69].

The second important stage in the development of human rights in France was the adoption of the Constitution of 1946 and further amendments towards it. This constitution clarified and systematized the provisions of the Declaration of 1789, and also introduced a new block of social and economic rights for example, the right to rest, material security, in case of disability, equality between men and women, etc. The Declaration paid special attention to the right to work and protection of working conditions. A number of certain articles of the Constitution, such as the right to strike, the right of workers to participate through delegates in the collective determination of working conditions in the management of enterprises, the right to health protection contributed to the expansion of citizen rights in relevant areas [3]. Thus, these laws continued the legal tradition of linking inalienable human rights to the existing civil rights in France thereby forming a free and equal society. It should also be emphasized that the Universal Declaration of Human Rights of 1948 played a significant role in expanding of political rights of citizens. These rights were expressed in freedom of thought, conscience and religion, freedom of peaceful assembly and association, freedom of opinion and expression [2]. Adopted on October 4th, 1958 the Constitution of France which is the current Constitution of the country regulating the activities of the Fifth French Republic to this day.

The beginning of the third stage is considered to be the 1990s. For the most part, this period is marked by problems within the country. First of all, it affected the issues of migrants and refugees as well as the illegal detention of migrants. On August 24, 1993, the Law "On the Regulation of Immigration, conditions of entry and stay of foreigners in France" was approved [6]. In accordance with the term of detention of a foreigner who did not submit his documents to the police was increased. The Law "On expanding the rights of identity verification" of August 10, 1993 granted police officials the right to check the documents of any suspicious person under any circumstances, and not only when the latter commits an offense [7]. The law "On Citizenship", adopted on March 16, 1998 simplified the procedure for obtaining French citizenship for children of immigrants [8]. The reason for their naturalization was a permanent residence in the country for five years. There is no longer a need to reach the age of majority and manifest one's own will in the form of submitting an official application to state bodies.

The last stage is characterized by the active participation of France in the development of new norms within the sphere of human rights protection. It was accordingly the initiative of France that several special procedures of the Human Rights Council were created: the Working Group on

Enforced Disappearances, the Working Group on Arbitrary Detention, the Special Rapporteur on extreme poverty and human rights.

France actively participated in the adoption of the European Union Guidelines on the Rights of the Child (2007) and the European Union Guidelines on Children and Armed Conflict (2003, revised in 2008) as well. In addition, France was one of the initiators of the Council of Europe campaign to protect children from sexual exploitation and violence and one of the first signatories of the Council of Europe Convention on the Protection of Children from Sexual Exploitation and Sexual Violence entered into force on July 1st, 2010 [4].

France is a co-sponsor of country resolutions on human rights situation in Syria, Iran, North Korea, Myanmar and the Crimea which are annually adopted by the UN General Assembly. With regard to the thematic resolutions, it should be noted that France together with the Netherlands submits a resolution on the elimination of all forms of violence against women every two years. Basically, it actively supports the resolution called for a universal moratorium on the use of the death penalty, the resolution on human rights and extreme poverty as well as the resolution submitted by the European Union on the elimination of all forms of intolerance based on religion or faith. At the same time, France is actively and vigilantly monitoring the next steps after the World Conference against Racism, Racial Discrimination, Xenophobia and Related Intolerance held in Durban in 2001 [1].

In January 2013, an interdepartmental mission was established to protect women from violence and to combat human trafficking known by its abbreviated French name MIPROF. The principal purpose of the mission is an improved protection of victims faced human trafficking. The struggle for the abolition of the death penalty has a highly symbolic significance in the field of human rights protection. Awareness of the need to abolish the death penalty is growing on all continents regardless political system, the level of development or cultural traditions.

Everywhere there is a tendency to reduce the number of death sentences and their execution. Today more than 60% of the world's countries have abolished the death penalty de jure or de facto. Over the past 20 years more than 50 states have excluded the death penalty from their criminal codes.

Due to the fact of its resolute actions for the universal abolition of the death penalty today France occupies a generally recognized place among States participating in this struggle.

During its chairmanship of the Committee of Ministers of the Council of Europe from May 17 to November 27, 2019 France has made efforts to consolidate the main achievements of the Council of Europe in the field of human rights protection and to further unite Europeans, promoting equality and the concept of "living together". For example, it initiated work on the creation of the Monitoring Center for Teaching of History and campaigned for Istanbul Convention.

Thus, human rights are defined as the inalienable rights of all people in despite citizenship, place of residence, gender, ethnicity or nationality, skin color, religion, language or any other aspect. Respect for the principles of human rights protection is the heart of the issue of French democracy and obligations both in the European Union and international organizations. These commitments are translated into political and diplomatic actions at the national, European and international levels combined with the maintaining of support and cooperation within priority areas. France is particularly active in the following areas such as universal abolition of the death penalty, fight against impunity, arbitrary detention and enforced disappearances, respect for women rights, fight against the recruitment of child soldiers as well as fight against discrimination based on sexual orientation and gender identity. This activity is carried out jointly with the international community and also with French and foreign NGOs. French diplomacy does not limit itself concerning these issues although strives through its actions within the framework of multilateral and bilateral relations to combat human rights violations wherever they are committed.

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МЕЖДУНАРОДНО-ПРАВОВОЙ БАЗИС ЗАЩИТЫ ПРАВ ЧЕЛОВЕКА INTERNATIONAL LEGAL BASIS FOR THE PROTECTION OF HUMAN RIGHTS

Аннотация. В данной статье рассматривается международно-правовой базис защиты прав человека. Тема является актуальной сегодня в силу появления различных условий и факторов, представляющих угрозу для прав человека в современном глобализированном многополярном мире. В статье приводится обзор фундаментальных прав и свобод человека, а также приводятся их классификации. Кроме того, проводится анализ эффективности международных инструментов и механизмов защиты прав человека, начиная с внутреннего законодательства различных государств и заканчивая работой многих международных организаций, судов и комитетов. Авторы также рассматривают проблему повышения информированности общества о защите прав человека.

Abstract. This article deals with the international legal basis for the protection of human rights. The topic is very relevant today due to arising of various challenges and factors threatening to human rights in the modern globalized multipolar world. The article provides overview of core human rights and freedoms as well as gives insight to their classifications. In addition, it analyses effectiveness of international instruments and mechanisms for protection of human rights and freedoms ranging from internal legislation of various states to the work of international organizations, courts, committees. The authors also consider the importance of raising public awareness of human protection.

Ключевые слова: права человека, международные правоотношения, международные организации, международные правовые акты.

Key words: human rights, international legal relations, international organizations, international legal acts.

In the 21st century, humanity is increasingly aware of the interdependence of all members of the modern community, which contributes to a better understanding of the need for collective action in areas such as ensuring peace and security, creating a regime for the non-proliferation of weapons of mass destruction, international trade and investment, human rights, migration, maintaining a favorable environment, etc.

It was after the Second World War that intensive awareness by the global community of the planetary significance of effective protection of human rights began. This problem began to turn from an internal one into an international one, as a result of which the constitutional law of various states began to increasingly come under the influence of international standards. Today it is already generally recognized that human rights, no matter where in the world a person lives, are under the protection of the world community and are the property of the entire human civilization. During the Second World War leaders of the countries of the anti-Hitler coalition came to the conclusion that

after the victory in the war, a new mechanism was needed that would be created to maintain and strengthen international peace and security as well as develop cooperation between states.

For these purposes the United Nations Organization was created in 1945. The UN structure consists of six main bodies: the General Assembly, the Security Council, the Economic and Social Council, the Trusteeship Council, the UN International Court of Justice and the UN Secretariat. Within the broader UN system, a number of specialized international agencies, funds and programs operate, including the World Health Organization, the World Food Program, UNESCO, UNICEF, etc. All these bodies perform their specific functions, protecting human rights in various fields, supporting international stability and security.

The UN Charter was approved at the San Francisco Conference in 1945, signed on June 26, 1945 by representatives of 50 states and entered into force on October 24 of the same year – this day is celebrated as United Nations Day.

When the United Nations was created, the very first line of the preamble to the UN Charter stated that “We, the peoples of the United Nations, in full determination to save succeeding generations from the scourge of war, which twice in our lives brought untold sorrow to humanity, strive to reaffirm the belief in fundamental rights and human freedom”.

The UN Charter also enshrines the basic principles of international cooperation: sovereign equality of all UN members; resolution of international disputes exclusively by peaceful means; refusal in international relations from the threat of force or its use in any way incompatible with the goals of the UN; non-intervention of the UN in matters that are essentially within the internal competence of any state, etc.

Despite the absence in the UN Charter of a list of fundamental rights and freedoms, not to mention their detailed definition, the principle of respect for fundamental human rights has become a peremptory norm imposing an obligation on all participants in international relations to comply with it.

At the same time, there are different opinions in the literature about the role that the UN Charter has played in the legal regulation of human rights at the international level. J. Humphrey notes that the UN Charter only in passing pays attention to fundamental human rights and freedoms [7].

A.P. Movchan points out that the UN Charter became the document in which the principle of universal respect for fundamental human rights and freedoms without any discrimination was first enshrined [5]. J. Brownlee argues that the essence of the concept of human rights in the Charter is expressed quite definitely [2]. Joining the second group of opinions, it should be noted that, being a kind of “constitution” of modern international relations, the UN Charter made a significant step in the development of world civilization, for the first time at a universal level imposing obligations on various states to respect and observe human rights and freedoms.

Based on the provisions of the UN Charter, a number of documents in the field of respect and protection of human rights were developed and adopted. First of all, it should be noted the Universal Declaration of Human Rights, adopted by the UN General Assembly on December 10, 1948. This Declaration laid the foundation for the path to ensuring inalienable human rights and their protection both domestically and internationally.

The Universal Declaration of Human Rights consists of a preamble and 30 articles. It does not distinguish between human rights and civil rights and treats all rights as belonging to all people. Article 1 states: “All people are born free and equal in dignity and rights. They are endowed with reason and conscience and should act towards each other in a spirit of brotherhood. “Further, the rights to life, liberty and security of person, other personal rights and freedoms, as well as economic, social and cultural rights are proclaimed, to which a person has the right to claim as a “member of society” (the right to work, social security, education, etc.) [8].

In addition, several conventions have been adopted within the framework of the UN, which, in particular, include:

1. Convention on the Prevention and Punishment of Genocide, 1948;
2. International Declaration on the Elimination of All Forms of Racial Discrimination, 1963;

3. Convention against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment, 1984;
4. Convention on the Rights of the Child 1989;
5. Convention relating to the Status of Refugees, 1951 and Protocol Relating to the Status of Refugees, 1967;
6. Convention on the Rights of Persons with Disabilities and its Optional Protocol, 2006;

The main difference between these most important sources of international law is that within their framework, so-called convention committees of independent experts have been created to monitor the implementation of these treaties. In order to effectively implement the protection of human rights in its various aspects, the UN has endorsed the UN Standard Minimum Rules for Non-custodial Measures (Tokyo Rules); The United Nations Guidelines for the Prevention of Juvenile Delinquency (El Riyadh Principles); UN Standard Minimum Rules for the Administration of Juvenile Justice (Beijing Rules); The Body of Principles for the Protection of All Persons under Any Form of Detention or Imprisonment; Principles for the protection of mentally ill persons and the improvement of mental health care, etc. [4].

Also, in 1966, the UN General Assembly adopted very important acts - the International Covenant on Economic, Social and Cultural Rights and the International Covenant on Civil and Political Rights (ratified by the USSR in 1973). These acts provide a more detailed list of human and civil rights, and in addition, the International Covenant on Civil and Political Rights provides for the creation of a Human Rights Committee, responsible for the observance and implementation of measures to implement the rights recognized in this Covenant.

The most successful classification of human rights and freedoms according to the criterion of admissibility of their limitation is proposed by S.V. Bakhin, who, as a result of a detailed analysis of the International Covenant on Civil and Political Rights of December 16, 1966, divides them into rights that can be limited, and not subject to any restrictions, i.e. absolute rights. Among the rights that may be limited, he includes the right to freedom of movement, the right to leave any country (Article 12), the right to freedom of expression, the right to receive and impart information (Article 19), the right to peaceful assembly and the right freedom of association and the creation of trade unions (Articles 21, 22), freedom to profess any religion or belief (Article 18). To the rights that are not subject to any restrictions, the absolute rights of S.V. Bakhin attributes: the right to life, the right not to be subjected to cruel, inhuman treatment, the right not to be subjected to medical or scientific experiments without free consent, the right not to be held in slavery or servitude, etc. [1].

In addition, there are other international legal acts that aim to protect human rights in various spheres of public relations.

One of them is the Convention for the Protection of Human Rights and Fundamental Freedoms, adopted in Rome on November 4, 1950 (Russia ratified on March 30, 1998). Members of the convention are members of the Council of Europe, which is an intergovernmental organization.

The Convention enshrines a number of personal, economic, political and social rights: the right to life; prohibition of torture, inhuman or degrading treatment or punishment; the prohibition of slavery and forced labor; the right to liberty and security of person; the right to a fair trial; non-retroactivity of the law in criminal law; freedom of thought, conscience and religion; freedom of expression; freedom of assembly and association; prohibition of discrimination; the right to education; freedom of movement and choice of residence; the right of a citizen to leave the country and return to it. Protocol No. 6 to the Convention contains the prohibition of the death penalty. Protocol No. 7 enshrines procedural guarantees in the event of expulsion of foreigners, the right to appeal against sentences in criminal cases in the second instance, compensation in the event of a miscarriage of justice, the right not to be tried twice for one crime, and equality of spouses. A number of protocols were also adopted, which improve the control mechanism established in accordance with the Convention.

A special section has established the European Court of Human Rights, designed to ensure compliance with the obligations of member states under the aforementioned Convention. The European Social Charter was also created (1961). The States participating in the Charter have pledged

to take joint action to improve the standard of living and the well-being of all segments of their population, both urban and rural, through appropriate institutions and actions. The Charter, being the brainchild of the Council of Europe, unlike the 1950 European Convention for the Protection of Rights and Freedoms, enshrines not civil and political, but socio-economic rights [6].

The Final Act of the Conference on Security and Cooperation in Europe (CSCE), held in Helsinki in 1975, also plays a huge role in human rights protection at the international level. The provisions concerning human rights and fundamental freedoms enshrined in the Final Act are, in fact, the development and concretization of the principles proclaimed in the UN Charter. The final act of the Helsinki meeting provides for a set of measures in the humanitarian and other fields (development of contacts between people, dissemination of information, cooperation and exchange in the field of culture and education). To prevent these measures from being used to interfere in the internal affairs of other states and violate their sovereignty, the Final Act emphasizes that they must "be carried out in full compliance with the principles governing relations between states."

When considering the issue of the legally binding force of international instruments adopted as a result of meetings within the framework of the CSCE / OSCE, it should be assumed that these instruments are not international treaties legally binding their participants. These documents are only agreements that represent general approaches to solving various problems in the field of human rights and fundamental freedoms, constituting uniform standards in this area.

During the first 20 years of its existence (1975–1995), the CSCE functioned very effectively. But the transformation of the CSCE into the OSCE, which took place in 1995, led to a decline in the role of the Organization. Over the past time, the OSCE has failed to realize practically none of the goals for the achievement of which it was created. The pan-European collective security system does not work; The OSCE never became a regional security organization. With the expansion of the Euro-Atlantic community, responsibility for security and economic cooperation has shifted to NATO and the EU [3].

In conclusion, it should be noted that by the beginning of the 21st century the mankind has made significant progress in the field of human rights and freedoms. Today many aspects of human life are protected by many international treaties and convention institutions to monitor the implementation of these treaties. This understanding is based on the fact that a human, as a creation of nature, inhabiting our planet, is considered outside the borders of states and societies. In this capacity, he or she has certain natural and inalienable rights. At the same time, a human is the basis and forming element of all social and political societies, each of which has its system of values and, naturally, looks at human rights and freedoms through its prism.

All people have natural rights, but as members of society they also acquire positive rights guaranteed by the state and enshrined in its laws. Life, freedom, equality, security are fundamental values of all peoples of the world. However, each nation puts its content into them. Hence a different understanding of the human rights associated with them follows. In order for internationally recognized human rights and freedoms to be realized in practice, and national and international institutions for the protection of human rights to be able to establish and assess with certainty the real state of affairs in this area, uniform, internationally agreed dimensions of recognized rights are needed.

In the regulation of issues related to human rights, the role of international law is increasing, which is expressed, firstly, in the increasingly detailed development and concretization of international principles and norms governing fundamental human rights and freedoms that must be respected by states, and secondly, in the creation of international convention bodies to monitor the implementation of the obligations assumed by the States parties to the conventions.

Despite the fact that the fundamental provisions of international human rights law are accepted by most of the states of the world, the specific legal status of an individual in society depends on the legal system existing in a given state, on the appropriate legal regulation. In a democratic legal system, an individualistic approach to human rights prevails, based on the priority of the individual over society and the state.

In the 21st century such fourth-generation rights as the human right to a safe environment, clean drinking water, clean air, etc., are gaining international recognition. The problem of human rights and freedoms, in this case, can be solved only by solving several multi-level tasks – eradicating poverty, ensuring sustainable human development, raising the educational level of the entire population, improving government institutions, and ensuring the rule of law. However, it is important to remember that only a person himself can become the main defender of human rights, freedoms, honor and dignity. The more a person knows about all his rights and freedoms, about the norms and rules of the relationship of free individuals, which are the basis of both civil and political society, the more effective this protection will be. From this we can draw the conclusion that the international community has come to – it is essential to teach people the science of human rights and freedoms.

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ТЕНДЕНЦИИ РЫНКА ОХРАННЫХ УСЛУГ В РОССИЙСКОЙ ФЕДЕРАЦИИ **TRENDS IN THE SECURITY SERVICES MARKET IN THE RUSSIAN FEDERATION**

Аннотация. Статья посвящена тенденциям рынка охранных услуг в России. В статье дано определение понятия «охранная услуга», рассмотрены виды охранных услуг. Предложенный анализ рынка охранных услуг проводился на основании данных Федеральной службы государственной статистики. Также, были изучены вопросы средней численности работников предприятий отрасли, количество предоставленных услуг на протяжении 4-х лет, проанализированы факторы, которые оказывают положительное воздействие, а также основные тенденции частных охранных предприятий.

Abstract. The article is devoted to the trends of the security services market in Russia. The article defines the concept of “security service”, considers the types of security services. The proposed analysis of the security services market was carried out on the basis of data from the Federal State Statistics Service. Also, the issues of the average number of employees of the industry enterprises, the number of services provided over 4 years were studied, factors that have a positive impact were considered, as well as the main trends of private security companies were considered.

Ключевые слова: тренд, тенденция, охранная услуга, рынок охранных услуг, частная охранная деятельность, конкуренция.

Key words: trend, trend, security service, security services market, private security activity, competition.

The market of security services was formed in Russia in the 90s, due to the fact that it was during this period that the need arose to protect private entrepreneurship, and hence the corresponding demand. According to experts, the increased demand for security services is also associated with the complex terrorist situation in the world. In Western countries, the growing demand for private security services is also associated with a reduction in budget expenditures on public security and the influence of public opinion. The development of the security services market is objectively necessary to maintain a high level of economic security of individual economic entities, to protect fundamental rights, including the inviolability of people and property, and, ultimately, to ensure national security.

In the security services market, competition primarily arises between public and private security companies. The quality of services provided is the main criterion for the competitiveness of enterprises in the market. The most promising direction for improving the quality of security services is the development of the technical base, since the use of engineering and technical means allows to increase the efficiency of the process of providing services, reduce costs and improve quality by responding more quickly to emerging threats to the security of the protected object.

The available scientific approaches and research results in the field of security services are

not exhaustive, therefore it is impossible to objectively assess the structure of the Russian market in terms of the volume of services provided, their type and quality. The problems of the development of regional security markets, the formation of sustainable competitive advantages of enterprises providing security services, and the problems of assessing the quality characteristics of security services remain unexplored. In this regard, the relevance of security services market research is increasing.

There is also an increase in demand for security services in Russia, which is mainly due to the complex criminal situation, which can be illustrated by several facts: firstly, in terms of the number of murders per 100 thousand inhabitants, Russia ranks among the first in the world and first in Europe (14.9 in Russia, whereas, for example, in Germany – 0.86); secondly, Russia ranks fifth in the world in the total number of registered crimes. As a result, the population and business seek to protect themselves, which means that the demand for goods and services related to security is growing.

It should be noted that security services are sufficiently fully covered in domestic and foreign scientific literature from the point of view of legal issues reflecting the legal aspect of the functioning of security organizations. Issues directly related to the provision of security services are touched upon in the works of such specialists as I.A. Goloshchapov, N.G. Krayushenko, V.I. Shestakov, A.G. Dikov, S.V. Kondratyukov, A.V. Milkov.

To analyze the security services market, we will determine what belongs to the category of “security services”. A security service (security activity) is understood as an activity carried out with the use of special means and techniques by specially authorized entities (organizations) to ensure the state of safety from illegal encroachments transferred to the protection of objects [7, p. 16].

A.G. Dikov defines a security service based on the concept of “problem”: “protection of an individual or organization from unexpected problems associated with harm to the life or health of citizens, property of individuals or legal entities” [4, p. 11].

S.V. Kondratyukov notes: “Protection is a socially useful service that provides for the provision on a voluntary, paid, and in some cases on a mandatory and gratuitous basis (state measures and self-protection) of specific actions aimed at ensuring the safety of life (health), property, property, economic and other types of security of legal entities and individuals, on the basis of a contract or law” [5, p. 15].

An analysis of the literature has shown that there is currently no single approach to describing the variety of security services.

Private security activity differs from law enforcement activity carried out by state bodies on the following grounds:

- by its nature, private security activity is carried out on a contractual basis and is designed to make a profit;
- private security activity is based on contractual relations, where the limits and time of the emergence and termination of these relations are clearly defined;
- private security activities are mainly preventive in nature. The competence of these structures ends (passes to state law enforcement agencies) in the case of criminal acts against the client [1].

Certain types of security services are defined in Article 3 of the RF Law No. 2487–1 of 11.03.1992 “On Private detective and security activities in the Russian Federation”. Below is a more detailed classification of security services according to different criteria.

So, according to the criterion of organizational form, there are:

- state organizations (departmental, non-departmental security) – Rosgvardiya, police, department of non-departmental security (PSB), paramilitary security (VOHR), etc.;
- private security organizations (PSC, PSC) providing security services on the basis of a state license, in accordance with the legislation of the Russian Federation;
- alternative security – civilians (watchmen, supervisors, watchmen) and guard services, control services and other security services of organizations engaged in self-protection (independent protection of their property);
- combined (mixed) protection in various variations listed above.

According to the types and methods of protection used, physical protection (people, guards), technical protection (engineering, electronic), protection against disclosure of trade secrets and comprehensive security are distinguished.

According to the objects of protection, there is protection of stationary objects (buildings, premises, property), protection of mobile objects (during the transportation of valuable goods), protection of life and health of citizens, as well as protection of trade secrets.

According to the methods of protection, there are:

- stationary posts (checkpoints) – internal, external, open (outdoor), closed (indoor),
- mobile posts (patrol), on foot or using bicycle, motorcycle and/or motor vehicles, video surveillance operators at monitoring posts,
- canine service, with the use of guard dogs;
- cargo support during railway, auto, air transportation;
- Rapid Response Team (GBR);
- remote security [1].

All security activities are divided into corporate security and the security services market, the activities of which are carried out by public and private security companies.

Security services of legal entities (corporate security) – security activity, the peculiarity of which is the possibility of interference in the personal life of the protected object).

Private detective firms perform operational, investigative and analytical functions, in particular, they investigate criminal cases, collect confidential information requested, provide services on contractual terms to protect property, life and health of citizens, provide advice on protection against criminal encroachments.

Also, security activities include the work of enterprises providing the production of complex software and hardware for the protection of information systems, as well as organizations in the field of information, commercial, fire and environmental safety.

According to experts, in 2015–2019, the number of private security services in Russia increased by 16.2% and reached 92.1 million. services, as can be seen in Figure 1. Private security services involved the work of physical security (from 12 to 24 hours), the installation of an alarm system and its maintenance.

The increase in the number of security services was largely due to the development of retail chains (since stores must be guarded), the growing demand for warehouse real estate, the opening of new production and infrastructure facilities, as well as stricter requirements in the field of security and protection of social facilities (schools, kindergartens, training centers, etc.).

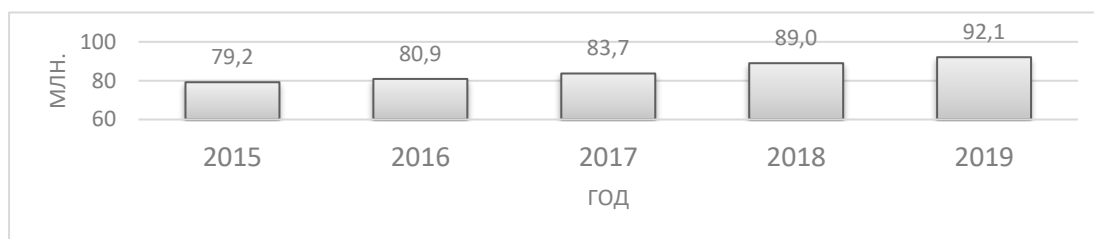


Figure 1. The number of security services rendered in the Russian Federation in 2015–2019 [3].

The number of security companies, that is, those whose code according to the All-Russian Classifier of Economic Activities (OKVED) was 80.10 “Activities of private security services”, in 2019 amounted to 24,472 (Table 1) enterprises. These enterprises included all operating organizations that indicated this type of activity as the main one. It should be borne in mind that the company could work in another field or not work at all. For this reason, the number of companies in the sector is a rather conditional indicator.

Table 1. The number of enterprises of enterprises providing security services by form of

ownership in the Russian Federation, 2019 [3]

Form of ownership	2019 y.	Fraction, %
State	253	1,03
Private	24 014	98,13
Municipal	22	0,09
Other	183	0,75
Total	24 472	100

The majority of companies providing security services in Russia in 2019 were private – 98.13% of enterprises. It should be noted that obtaining a license for security activities is a prerequisite for the work of all companies in the industry.

From 2016 to 2020, the number of security companies in the Russian Federation increased by more than 16%, due to a variety of factors: the development of retail chains, the opening of new sports, shopping and entertainment facilities before the football championship, increased security requirements for state social facilities.

However, in 2020, the coronavirus pandemic has made its own adjustments to the development of the country's economy, especially in the field of security. During this year, the number of security services decreased by almost 5.5%. At the same time, this segment belongs to the category of stable and anti-crisis, since security is always needed – both for business and for individuals. The decrease in demand for security personnel in 2020 is due to the temporary closure of enterprises for the period of strict spring quarantine.

The demand for personal security decreased by an average of 20%, but the need for remote security has increased significantly. Large security companies have survived 2020 and are confident in the future, but it will be difficult for small private security companies to compete.

In 2020, many organizations brought down the price and worked almost to zero in order not to lose customers. In addition, the cost part of those companies that worked during quarantine measures has also increased, because the requirements for security guards and safety standards have increased. The costs of purchasing sanitary and hygienic masks, gloves, antiseptics and disinfectants fell on the shoulders of security organizations, because security works practically on the front line – on a par with doctors, sellers and security forces.

As for the average number of employees of enterprises in the industry, in 2017–2019, the official staff of organizations providing security services in Russia decreased by 7.2%: from 263.0 thousand people to 244.1 thousand people (Table 2).

Table 2. Labor resources of security industry enterprises in the Russian Federation, 2017–2019 [3]

Indicator	2017 y.	2018 y.	2019 y.
Labor resources of industry enterprises (thousand people)	263,0	253,6	244,1
Growth rate, % compared to the previous year	–	–3,6	–3,7

It should be noted that data on the number of labor resources in the sector are collected by the Federal Statistical Service on the basis of company reporting data. As a result, the actual number of personnel may differ, since experts believe that there is an artificial underestimation of real data [3]. So, according to industry experts, in 2019, about 700,000 people in Russia regularly worked in private security organizations.

Thus, the security services market is promising, and its distinctive feature is competition, which requires effective management of the competitiveness of the enterprise.

The reduction in the number of services in 2020 is primarily due to the closure of individual companies that use security services and the temporary downtime of some organizations during the lockdown period.

A number of factors also negatively affect the development of the security services market:

- the absence of a unified state policy in the field of security activities of the Russian Federation as a whole, that is, this factor slows down the development of public and private security, as it creates serious difficulties for the adoption of legislation that meets the needs of practice, the interests of customers of security services, generates conflicts between various subjects of protection. The analysis of the current legislation in the field of protection indicates that it mostly does not meet the modern practice of security activities and requires improvement.

- lack of conditions for investment in the security business. This factor is caused by the lack of incentives for investors in enterprises engaged in security activities; the lack of fixed assets and material and technical base, which can be the object of investment.

Thus, in 2021–2024, we can expect a minimum growth in the volume of the security services market at the level of 1.2–2.5% per year. The crisis economic situation and the decline in the country's population in the forecast period will lead to a general decrease in consumer demand for most goods and services, which will negatively affect the opening of new outlets.

In the segment of state construction, the financing of new social facilities will also be reduced, mainly the replacement of previously functioning dilapidated houses will occur, as a result of which an increase in the number of state institutions should not be expected. As a result, the demand for security services will grow as the economic situation stabilizes, and this year we should expect a small growth in the security services market to 2%. Along with the improvement of the economic situation in Russia, the demand for the services of private security companies will grow. According to optimistic forecasts, by 2024, activity in the security sector will amount to about 93 million services, which is quite a bit higher than in 2020.

Innovative technologies that have proven their effectiveness during the quarantine period are in trend. Gradual transition from post surveillance to automated territory control systems. The new approach will reduce the cost of security services and the cost of perimeter security. Physical security is not doomed yet, but it is already close to it. The demand for security guards has already decreased, and even at state facilities security posts are becoming less frequent. The security industry has realized that the future belongs to new intelligent technologies and it is necessary to invest in this direction in order to win the competition.

Another undeniable trend is the integrated and multitasking approach of private security companies. Modern security guards are not strictly a narrow-specialized company with a staff of 10–20 security guards. Those who have the widest possible range of security services will survive in the new realities. Physical and technical protection of the facility, protection of a mass event and a business meeting, cargo escort, personal protection of the client – all these issues should be solved by one security company.

It is much easier and often cheaper for a client to contact a “universal” private security company and get comprehensive service than to find several performers. In the future, private security companies will have to raise the standards of service, and customers will have to learn how to choose professionals.

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БОРЬБА С КИБЕРПРЕСТУПНОСТЬЮ: АНАЛИЗ ЗАКОНОДАТЕЛЬСТВ МИРА COMBATING CYBERCRIME: ANALYSIS OF LEGISLATIONS WORLDWIDE

Аннотация. В статье анализируется современное состояние законодательного регулирования уголовно-правовых отношений в сфере обеспечения информационной безопасности и практики борьбы с киберпреступлениями. Рассматриваются закономерности в

развитии уголовного законодательства об ответственности за преступления в сфере борьбы с киберпреступностью и унификации национальных законодательств в области уголовно-правового регулирования отношений в сфере информационных технологий и обеспечения информационной безопасности.

Abstract. The article analyzes the current state of legislative regulation of criminal legal relations in the field of information security and practice of combating cybercrime. The article also reviews regularities in the development of criminal legislation regarding liability for cybercrime offences and unification of national laws in the field of criminal-legal regulation of relations in the field of information technology and information security.

Ключевые слова: информационная безопасность, борьба с киберпреступностью, киберпреступление, компьютерное преступление, противодействие.

Key words: information security; fighting cybercrime; cybercrimes; computer crimes; counteracting cybercrime.

Legal measures play a key role in preventing and combating cybercrime [1, p. 51]. Law is a dynamic tool that enables the state to respond to new societal and security challenges, such as the appropriate balance between privacy and crime control, or the extent of liability of corporations that provide services. We shall explore the history of the emergence of such laws.

The first bill criminalizing information technology crimes was drafted in the United States back in 1977. On the basis of this bill in October 1984 the Computer Fraud and Abuse Act (CFAA) was adopted – the main legal act establishing criminal liability for crimes in the sphere of computer information. It has since been updated several times.

The Computer Fraud and Abuse Act establishes liability for several basic offences: computer espionage; unauthorized access to information; computer fraud; intentional or negligent damage to protected computers; threats, extortion, blackmail committed through the use of computer technology, and others.

The United Kingdom has had the Computer Abuse Act since August 1990. The first paragraph of the Act deals with unauthorized access to computer data. It establishes that a person commits an offence when he or she uses a computer to perform any function with the intention of providing access to any program or data contained in any computer if that access is knowingly unauthorized.

The distinctive feature of the criminal law regulation of liability for unauthorized access in the United Kingdom lies in its establishment in the statutes adopted by Parliament. They can be divided into two main groups: statutes establishing liability for computer crime, and statutes establishing liability for crimes related to the use of the Internet (internet-related crime).

Legislation on criminal liability for unauthorized access varies greatly around the world. A systematic analysis of the criminal codes of 16 foreign countries to study the experience of criminalization of unauthorized access leads to the following conclusions.

Unauthorized access in one form or another, depending on the form of expression, is enshrined in all of the criminal codes we have studied. The positions of foreign legislators regarding the criminalization of unauthorized access, we believe, can be presented in three groups.

The first group includes the position of legislators in Australia, Austria, Belgium, Denmark, France, which have enshrined in the criminal codes an independent corpus delict of unauthorized access.

To the second group, we refer the position of developers of criminal codes of Korea, Spain, Norway, Sweden, Switzerland, in which unauthorized access acts as a way of committing other crimes.

The third group, we believe, should include criminal codes of Poland, Holland, Turkey, where legislators not only consolidated unauthorized access as an independent structure but also provided for it as a way of committing other crimes.

In addition, the criminal codes of Belgium, Australia, France, Denmark, Norway also establish the liability of legal entities. And, for example, in the French Penal Code, in the chapter devoted to attacks on the automated data processing system, not only the possibility of criminal liability of legal entities is indicated, but also a detailed list of penalties that can be applied to legal entities for committing these crimes is provided.

The German Criminal Code uses a special term, Daten, which is defined in Section 202 of the Criminal Code as data that is stored or transmitted electronically, magnetically or in other ways that are not directly visible, i.e. computer data.

Unlawful acquisition by a person of computer data which were not intended for him/her, which are under special protection against unauthorized access, for the purpose of extracting benefit for himself/herself or for a third person shall entail imprisonment for a term of up to three years. Erasing, destroying, rendering useless, altering or attempting to alter the data is punishable by a fine or up to two years' imprisonment.

Article 303(b) of the Criminal Code covers such crimes as DNS attacks (computer sabotage) and the creation of malicious programs. The article defines computer sabotage – interference with data processing that is essential to a business, government agency, or someone's way of doing business – as a crime. Interference can be accomplished by destroying, damaging, rendering unusable, altering a computer system, or interfering with the transmission of data. These acts are punishable by up to five years in prison.

In the Russian Federation, liability for crimes in the area of computer information is regulated by Chapter 28 of the Criminal Code. Computer crimes are covered by three articles, namely unauthorized access to computer information (article 272 of the Criminal Code), the creation, use and distribution of malicious computer programs (article 273 of the Criminal Code) and violation of computer, computer system or computer network exploitation rules (article 274 of the Criminal Code).

International organizations are also creating cybercrime units. For example, Europol created the European Cybercrime Center (EC3) in 2013 to strengthen the law enforcement response to cybercrime in the EU and thereby help protect European citizens, businesses and governments against online crime [2, p. 5].

Numerous studies have shown that unifying national cybersecurity laws helps combat cybercrime. Below are examples of what unifying national laws helps in particular with.

It allows enabling global evidence collection – the harmonization of procedural law is a second indispensable requirement for effective international cooperation. Securing expedited preservation of data, for example, might legitimately be achieved either through a dedicated order, or general power of search and seizure [3, p. 61].

It helps to avoid criminal safe havens in the field of cybercrime, as for all transnational crimes the main advantage of harmonizing criminal law lies in the prevention of cybercrime safe havens for perpetrators. Cybercrime is a global problem, and this makes all countries important in one of several ways. Cooperation with developing countries is important on the basis that cybercrime knows no boundaries. Indeed, out of all transnational crimes, cybercrime likely offers the most direct risk for use of safe havens.

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ПРЕДОСТАВЛЕНИЕ СОЦИАЛЬНЫХ УСЛУГ В ПЕРИОД ПАНДЕМИИ PROVISION OF SOCIAL SERVICES DURING THE PANDEMIC

Аннотация. В статье рассмотрено понятие социальной услуги, приведен перечень социальных услуг, согласно законодательству; проанализированы данные, представленные центром изучения общественного мнения о том какими услугами, могли и воспользовались россияне в период пандемии, и если не смогли воспользоваться, то по каким причинам это произошло.

Проанализировано количество социальных услуг, из числа включенных в перечень социальных услуг субъекта Российской Федерации, оказанными организациями социального обслуживания, коммерческими организациями социального обслуживания и предприятиями других форм собственности.

Рассмотрев определенные данные, автор сделал вывод о том, что предоставление социальных услуг в Российской Федерации занимает одно из главных направлений в

социально-экономическом развитии страны, на которое расходуется большое количество средств из соответствующих бюджетов и осуществляется ряд мер по ее совершенствованию.

Abstract. The article examines the concept of social services, provides a list of social services, according to the legislation; analyzes the data provided by the center for the study of public opinion on what services Russians could and used during the pandemic, and if they could not use it, then for what reasons it happened.

The number of social services, from among those included in the list of social services of the subject of the Russian Federation, provided by social service organizations, commercial social service organizations and enterprises of other forms of ownership is analyzed.

Having considered certain data, the author concluded that the provision of social services in the Russian Federation occupies one of the main directions in the socio-economic development of the country, for which a large amount of funds from the relevant budgets is spent and a number of measures are being taken to improve it.

Ключевые слова: социальная услуга, пандемия, социальное обслуживание, жизнедеятельность, участие.

Key words: social service, pandemic, social service, vital activity, participation.

Both in domestic and foreign literature, the concept of a social service is an important lever of government on the part of the state, [5] because a social service is to help citizens improve their living conditions [2].

According to Article 20 of the Federal Law of December 28, 2013 N 442-FZ (as amended of June 11, 2021) "On the Basics of Social Services for Citizens in the Russian Federation", the social services received, taking into account their individual needs, are social services presented in Table 1 [6].

Table 1. Types of social services

№	Views	
1.	social	aimed at supporting the life of recipients of social services in everyday life
2.	socio-medical	aimed at maintaining and preserving the health of recipients of social services by organizing care, providing assistance in carrying out health-improving activities, systematic monitoring of recipients of social services to identify deviations in their state of health
3.	socio-psychological	providing assistance in correcting the psychological state of recipients of social services for adaptation in a social environment, including the provision of psychological assistance anonymously using a helpline
4.	socio-pedagogical	aimed at the prevention of deviations in the behavior and development of the personality of recipients of social services, the formation of their positive interests, the organization of their leisure time, assistance to the family in raising children
5.	social and labor	aimed at assisting in employment and in solving other problems related to labor adaptation
6.	social and legal	aimed at assisting in obtaining legal services, including free of charge, in protecting the rights and legitimate interests of recipients of social services

On its official website, the All-Russian Center for the Study of Public Opinion presented research data on the provision of social services in the year of the pandemic, namely, in the receipt of medical, household, labor, legal and other services [1]. The study, conducted in November 2020, involved 1,600 Russians aged 18 and over.

In 2020, 27% of Russians received social services. More often this was reported by representatives of young people 18-24 years old (37%), as well as residents of cities with a population of 500-950 thousand people (31%). On the contrary, 72% of Russians did not receive social services in the past year, more often residents of cities with a population of over one million (80%).

Three quarters of those receiving social services said they had no problem with it (75%). More often, representatives of the oldest age group 60+ years old (86%) and residents of small settlements: villages (80%) and cities with a population of up to 100 thousand inhabitants (81%) answered this way. Only 25% of those who received services had any problems, more often among 18–24-year-olds (30%) and among residents of million-plus cities (34%).

The main problems that 25% of those who received social services in 2020 (i.e. 7% of all respondents) faced with restrictions on movement due to quarantine (19%), the inability to get into state institutions, violation of their regime work (14%). There were also difficulties in obtaining sick leave and other problems in hospitals (12%), difficulties in making an appointment with a doctor (10%) or in general with obtaining medical or social assistance (10%).

As of January 1, 2021, the number of social services included in the list of social services of the constituent entity of the Russian Federation:

- provided by social service organizations that are under the jurisdiction of the constituent entity of the Russian Federation, amounted to 6,573,492,282 units;
- provided by commercial organizations of social services – 50 618 753 units;
- provided by non-profit organizations of social services, with the exception of socially-oriented non-profit organizations [3] – 169 187 808 units;
- provided by non-profit socially oriented social service organizations – 38,775,383 units;
- provided by individual entrepreneurs – 1,170,094 units.

Thus, after considering certain data, we can conclude that the provision of social services in the Russian Federation occupies one of the main directions in the socio-economic development of the country [4], which spends a large amount of funds from the relevant budgets and takes a number of measures to improvement [7].

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ПРИЧИНЫ ОТКАЗА ГЕОРГА V В ПРЕДОСТАВЛЕНИИ ПОЛИТИЧЕСКОГО УБЕЖИЩА НИКОЛАЮ II REASONS FOR GEORGE V'S REFUSAL TO GRANT POLITICAL ASYLUM TO NICHOLAS II

Аннотация. Более века назад, в 1917 году, в Российской Империи произошла Февральская революция (буржуазно-демократическая), спустя несколько месяцев уже в Российской республике свершилась Октябрьская революция (социалистическая). Эти события изменили ход истории нашего государства и повлекли за собой неизбежные последствия. Особую роль в научных исследованиях этих событий историки отводят «кровавой» трагедии, произошедшей в июле 1918 года, – расстрелу императорской семьи. Многие ученые и по сегодняшний день стараются разобраться в причинах отказа в предоставлении политического убежища Николаю II и его семье европейскими монархами, в частности, британским королем Георгом V, который был связан кровными узами с низвергнутым российским императором. Большое число исторических документов и материалов, разная их интерпретация содержат определенное количество предположений о причинах отказа, однако не раскрывают истинную

картину произошедших событий, мотивацию задействованных правителей и особенности их взаимоотношений. В данной статье вышеобозначенная проблема будет рассмотрена с позиций британских и российских историков на основе анализа материалов британских интернет-порталов, британских и российских средств массовой информации, научных статей и исследований.

Abstract. Over a century ago in 1917 in the Russian Empire came through the February revolution (bourgeois democratic). A few months later the October revolution (socialistic) occurred in the Russian republic. These events changed the course of the history of our state and entailed inevitable consequences. A special role in the historical scientific research into these events is given to the “bloody” tragedy which happened in July 1918 – execution of the imperial family. Many scientists are still trying to figure out the reasons for European monarchs’ refusal to grant political asylum to Nicholas II and his family. Historians pay special attention to British king George V’s refusal who was related by blood ties with the overthrown Russian Emperor. A large number of historical documents and materials, their various interpretations contain a certain number of assumptions about the reasons for the refusal. However, they do not disclose the true causes of the events that occurred, the motivation of the rulers involved and the specifics of their relationship. This article discusses the problem from perspectives of British and Russian historians and is based on the analysis of British Internet portals materials, British and Russian mass media publications, research articles and studies.

Ключевые слова: императорская семья, Династия Виндзоров, Георг V, Николай II, Временное правительство, Великобритания.

Key words: imperial family, the Windsor Dynasty, George V, Nicholas II, Provisional government, Great Britain.

British King George V and Nicholas II were maternal cousins as well as close friends. “Yes, my dearest Nicky, I hope that we will always continue our friendship with you... God bless you, my dear old Nicky, and remember that you can always count on me as your friend”. From a letter from George V to Nicholas II. Moreover, the two empires were allies during the First World War [5, p. 3]. It follows that the Russian Emperor could count on generous assistance from his cousin in case of necessary emigration. However, in reality, it happened in a completely different way, and the reasons for the refusal of the British monarch to let into his territory not only a geopolitical ally, but also his cousin (there was such a possibility) is still the subject of controversy of many historians and other experts. This determines the relevance of this problem and its high scientific significance in the study of the history of the period of the February and October revolutions. The aim of the study is to provide a historical overview of the events of that era associated with the reasons that motivated not only George V, but also the British Parliament and the British government to make such a difficult decision, which became the personification of the death sentence for Nicholas II and his family.

The events after the abdication of Nicholas II from the throne on March 2, 1917 took place as follows. E.Y. Sergeev, a Russian researcher, chief researcher at the Institute of general history of the Russian Academy of Sciences, in his article focuses on the issue of granting political asylum to the imperial Family. Immediately after the overthrow of the monarchy in Russia George V sent two telegrams to the British diplomatic mission. The first telegram expressed sympathy for Nicholas II, and the second one warned that attempts to use violence against the Russian imperial family would be negatively perceived in Great Britain [2, p. 12–13]. Pavel Milyukov, head of the Russian Foreign Ministry of the Provisional government, was personally acquainted with the received telegrams and was one of the initiators of the imperial family's move. On March 22, 1917, the British Cabinet of Ministers decided to grant political asylum to Nicholas II and his family for the period until the end of the war, subject to the allocation of funds by the Russian government. A few days later, King

George V decided to withdraw his invitation through the British Foreign Minister, Lord Arthur Balfour [5, p. 3]. Further, the head of the Provisional Government, Alexander Kerensky, claimed that in July 1917, the Minister of Foreign Affairs, Mikhail Tereshchenko, sent a telegram to London asking for the emigration of the Romanov family to Great Britain. However, Prime Minister Lloyd George gave the following answer to this request: "The government, unfortunately, cannot accept the imperial family as guests during the war" [5, p. 2]. Thus, the fate of the imperial family was sealed.

There are many hypotheses about the reason for George V's refusal to help his cousin and his family. For example, the British biographer of the royal family Theo Aronson wrote the following: "George V realized that most of his subordinates consider the Russian tsar as a bloody tyrant. That it is not the time for him, a constitutional monarch who fears for his own position, to lend a helping hand to an authoritarian ruler, no matter how closely related they may be. Therefore, the Russian imperial family was left to the mercy of fate" [3]. Some Western politicians hold the same opinion [5, p. 3]. This point of view is caused by the January events of 1905 ("Bloody Sunday"). Another reason for refusing Nicholas II could be the origin of his wife Alexandra Feodorovna who was even called a German spy. This could harm the reputation of Great Britain waging war with Germany [1]. Subsequently, the king changed the name of the family dynasty from Saxe-Coburg-Gotha to Windsor and renounced German titles to emphasize his nationality and his hostility against Germany. Majority of others historians agree on opinion that at the time of the events of 1917 there were a large number of supporters of left-wing ideas in Great Britain, some workers and trade union organizations reacted positively to the revolution in Russia. The king did not dare to provoke the British working class and was ready to sacrifice his cousin's life [1; 5, p. 3]. Also, many ordinary British citizens welcomed the revolutionary events of February-March 1917 in Russia positively, as they were sure that Russia would fight to the end and expressed sympathy for the members of the Provisional government that supported the country's transition to democracy [2, p. 9]. Prime Minister Lloyd George expressed fears about the revolution in Russia and assumed that Russia would not be able to continue to wage war against a common enemy [2, p. 10].

V.V. Fortunatov claims that the reason for this refusal was the gold of the Russian Empire and the personal gold of Emperor Nicholas II. After his renunciation, he could have been saved by the cousin in London who looked like him. However, the British, under a fictitious pretext, refused Kerensky to accept Nicholas II on their territory. Money played an important role here, because at that time in England there were 440 tons of Russian gold as collateral for military loans and only 5.5 tons of Nicholas II's personal gold. Thus, the Windsor dynasty became the closest heirs of all wealth [4, p 233].

To sum it up the following conclusion can be formulated. All these reasons considered together could have influenced the final and fateful decision of George V. It changed the course of history and left its mark on the fate of not only the imperial family, but also all of Russia. We believe that the main motive for the king's refusal was the gradual elimination of competition in Europe before the post-war world repartition. After all, the United States would also enter the war in April 1917. The salvation of the imperial family and assistance to the state, which also claims supremacy in Europe in the territory and for the means of production, was unprofitable for Great Britain, as it is described above, for many reasons. Therefore, in addition one quote should be given which contains phrase of the personal secretary of the king, Lord Stamfordham to the English ambassador in Paris about the firm intention of George V not to help Nicholas II: "It was the firm conviction of the king, who never wanted this" [5, p. 5]. This topic, due to its relevance and scientific significance, requires further study and analysis in order for the picture of the tragedy to be complete and clear.

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**ДИЗАЙН-КОД ПРОСПЕКТА НАХИМОВА КАК СРЕДСТВО
ФОРМИРОВАНИЯ ОБРАЗА ГОРОДА СЕВАСТОПОЛЯ
DESIGN CODE OF NAKHIMOV AVENUE AS A MEANS OF FORMING
THE IMAGE OF THE CITY OF SEVASTOPOL**

Аннотация. Данная статья посвящена определению дизайн-кода проспекта имени адмирала П.С. Нахимова в городе федерального значения Севастополь. Автор утверждает, что для этого необходимо учитывать историческую ценность территории города, что является одной из прерогатив государственных программ и в первую очередь направлено на сохранение и развитие культурных и духовных традиций. В связи с этим изучение формирования и развития общественных пространств в городе с целью функциональной и

пространственной модернизации структуры считается весьма актуальным в современных условиях городской среды. Важно отметить, что в статье представлен анализ пешеходных пространств, рекреационных зон, с целью выявления дизайн-кода проспекта Нахимова. В результате проведенного исследования автор разработал рекомендации по благоустройству территории проспекта Нахимова, который нуждается в реконструкции для улучшения качества общественной среды.

Abstract. This article is devoted to the definition of the design code of Admiral P.S. Nakhimov Avenue in the federal city of Sevastopol. The author argues that for this it is necessary to take into account the historical value of the city's territory, which is one of the prerogatives of state programs and is primarily aimed at preserving and developing cultural and spiritual traditions. In this regard, the study of the formation and development of public spaces in the city for the purpose of functional and spatial modernization of the structure is considered very relevant in modern conditions of the urban environment. It is important to note that the article presents an analysis of pedestrian spaces, recreational areas, in order to identify the design code of Nakhimov Avenue. As a result of the research, the author has developed recommendations for the improvement of the territory of Nakhimov Avenue, which needs reconstruction to improve the quality of the public environment.

Ключевые слова: дизайн-код, общественное пространство, пешеходная зона, проспект Нахимова, Севастополь.

Key words: design code, public space, pedestrian zone, Nakhimov Avenue, Sevastopol.

The first decades of the new century are characterized by active processes in urban urbanization and modernization of the saturation of the environment, functional processes, in conditions of various trends of intensive development of pedestrian space. Thus, the comfort level increases. A special place in this aspect is occupied by the renewal of the structure of public spaces of historical cities, the development of concepts of the quality of the environment that meets modern design requirements.

The city of Sevastopol has over two hundred years of history, has great historical potential. Along with modern buildings, there are buildings that are a monument of cultural heritage. Among them, the main spatial planning components, such as boulevards, stand out. The most important of them is P.S. Nakhimov Avenue. It is one of the main structural elements of the city space. For today the avenue needs a significant reconstruction since its existing space does not meet the requirements that should satisfy not only the residents but also the increasing flow of tourists.

Historical cities, in the modern trends of the formation of their territories, have historical continuity. Being important objects in the regional and national settlement system of the country, they initially reflect a rich historical and cultural potential [1]. It is necessary to take into account the historical value of the territory of cities, which is one of the prerogatives of state programs and primarily aimed at preserving and developing their cultural and spiritual traditions. In this connection, the study of the formation and development of public spaces of the city for the purpose of functional and spatial modernization of the structure is considered very relevant in modern conditions.

The purpose of the study is to develop the concept of a project proposal for the design code of the Nakhimov Avenue space – the main component of the historical center of the city structure – taking into account the dynamics of territorial development and increasing the international status of the city of Sevastopol, in the structure of the resort cities in Russia.

At the beginning of the XIX century, the avenue was part of Bolshaya Morskaya Street, which was a rocky road with uneven one-story buildings. Officers of the fleet and the garrison of the city lived in these houses. During the defense of Sevastopol in 1854–1855, the street was severely destroyed. In 1886, the street was divided in two, one of the parts became known as Nakhimov Avenue. In the pre-war period, buildings built at the end of the XIX century with two, three and four

floors stood along the avenue, but they were severely destroyed during the defense of Sevastopol (1941–1942) [3]. Nakhimov Avenue covers an area of 2.7 hectares, its length is 900 m. People who make up the majority of the avenue's attendance: local, military, tourists, workers, students, veterans council, city administration.

The author of the project, the chief architect of Senab Project LLC, for the improvement of this territory, will create a small pedestrian ring in the city center: Primorsky Boulevard – Matrossky Boulevard – Sinop Stairs – Nakhimov Avenue – Primorsky Boulevard. It is planned to recreate the territory where the pavilions for playing billiards were located earlier, to install platforms for a street art gallery, to create a small concert venue. It is planned to install a granite pedestal with a bronze plate near the Sinop stairs, which will tell about the Battle of Sinop [2]. Due to the current environmental situation, where a large number of cars pollute the air every day, modern trends tend to increase the number of plots with green spaces. Thus, Nakhimov Avenue needs landscaping of new zones and expansion of existing ones. To do this, you can use mobile flower beds, lawns and small architectural forms. The pavement on Nakhimov Avenue should be updated, namely, the paving stones on the pedestrian paths should be replaced, as well as on Nakhimov Square itself. Install public bike lanes. Provide the central part of the city with special technologies (ramps, paths, traffic lights, safe descents, etc.) for use by people with disabilities. Separate plots were allocated for the analysis of the improvement of the territory (Figure 1.1. and Figure 2.1.).

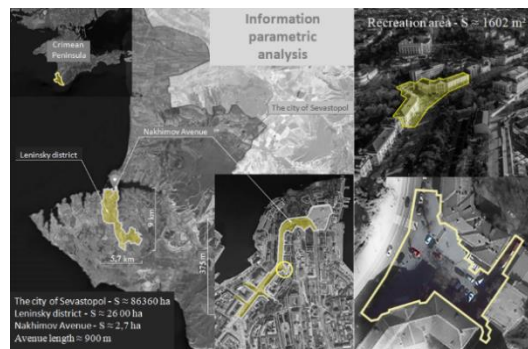


Figure 1.1. The territory of the first pocket "Recreation area"

It requires a unified concept of boulevard lighting with the addition of decorative illumination of buildings and structures, the elimination of visual noise and a systematic approach to the organization of information advertising support, as well as the renewal of pavement coverage (Figure 1.2.).



Figure 1.2. Analysis of lighting and pedestrian space

Renovation of the first level of residential buildings and structures in a single artistic and aesthetic style is required. Develop a recreation area (Figure 1.3.).



Figure 1.3. Analysis of the first level of residential buildings

Optimization of the spatial organization of guest parking on the territory of the avenue is required (Figure 1.4.).



Figure 1.4. Guest parking analysis

Due to the current environmental situation, where a large number of cars pollute the air every day, modern trends tend to increase the number of plots with green spaces. Thus, Nakhimov Avenue needs landscaping of new zones and expansion of existing ones. To do this, you can use mobile flower beds, lawns and small architectural forms (Figure 1.5.).



Figure 1.5. Analysis of landscape architecture

Sinopsky Descent is the longest of more than 600 stairs in Sevastopol. It was built in the 50s and 60s of the XX century and named after the outstanding victory of the Russian fleet in November 1853, when a squadron of the Black Sea Fleet under the command of Vice Admiral P. S. Nakhimov defeated the Turkish one in the Sinop Bay. The analysis of this territory showed the following results listed below [4] (Figure 2.1.).

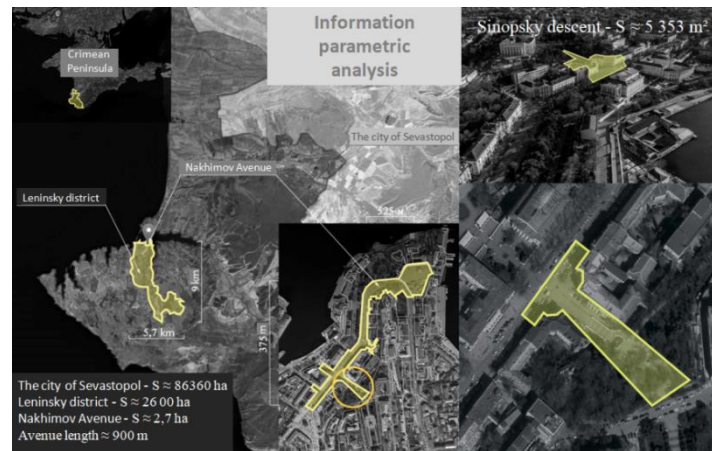


Figure 2.1. The territory of the second pocket "Sinopsky descent"

The lack of an integrated approach to the improvement of the territory (Figure 2.2.).



Figure 2.2. Analysis of landscaping

Administrative buildings (gemini), 1950 in need of reconstruction (Figure 2.3.).



Figure 2.3. Analysis of an architectural structure

Lack of landscaping requires the replacement of small architectural forms and decorative lighting (Figure 2.4.).

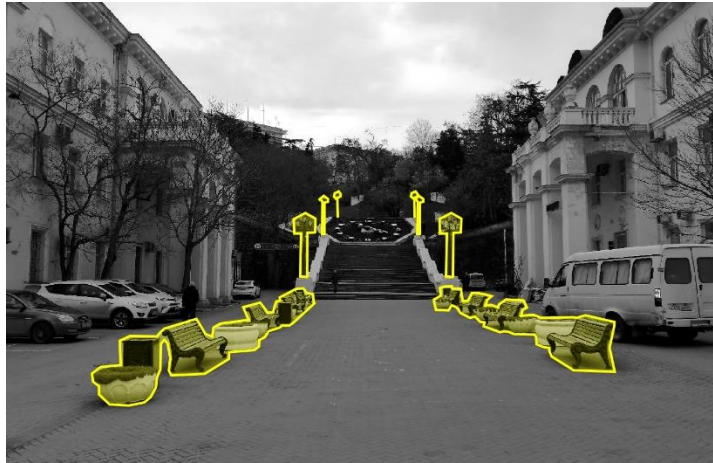


Figure 2.4. Analysis of landscape architecture

It requires covering the sidewalk and replacing the lighting of the territory (Figure 2.5.).

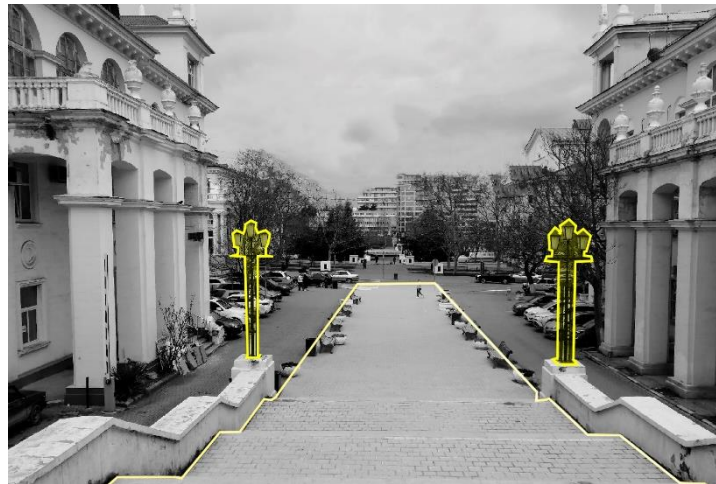


Figure 2.5. Analysis of lighting and pedestrian space

A system of approach to the organization of forging is required, to install bicycle paths for public use. Provide the central part of the city with special technologies (ramps, paths, traffic lights, safe descents, etc.) for use by people with disabilities (Figure 2.6.).

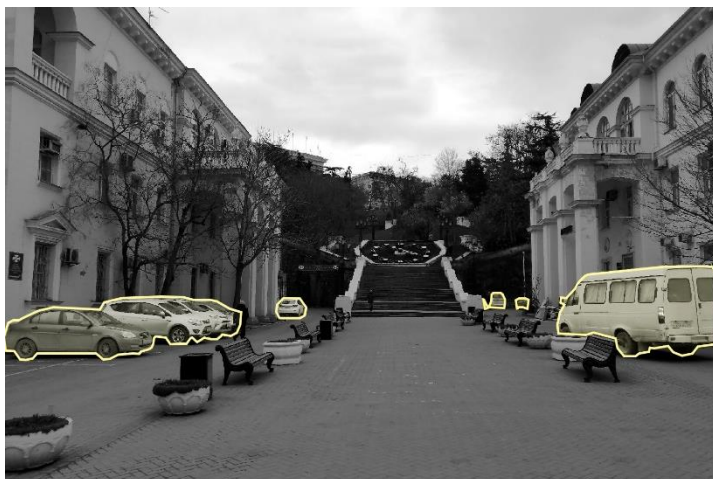


Figure 2.6. Guest parking analysis

The territory of the “Square near the theater named after A.V. Lunocharsky” (Figure 3.1.) should be also renovated.

Figure 3.1. The territory of the “Square near the theater named after A.V. Lunacharsky”

It requires a unified concept of alley lighting with the addition of decorative lighting and a systematic approach to the organization of informational advertising support, as well as the renewal of the pavement covering (Figure 3.2.).



Figure 3.2. Analysis of lighting and pedestrian space

Landscape gardening of the “Alley of Memorial Trees” is required, without damaging existing trees (Figure 3.3.).

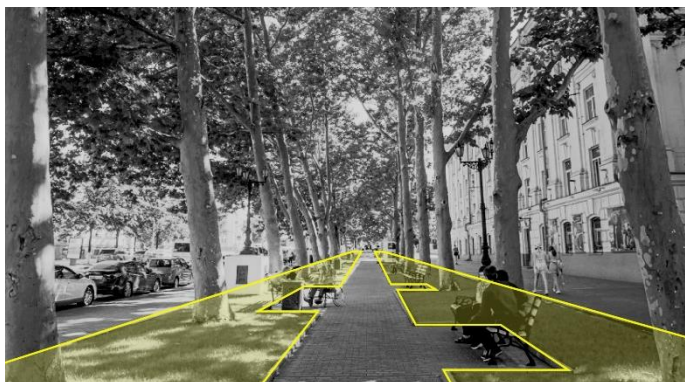


Figure 3.3. Analysis of landscape gardening

Renovation of the first level of the Lunacharsky Theater is required, as well as the replacement of small architectural forms (Figure 3.4.).

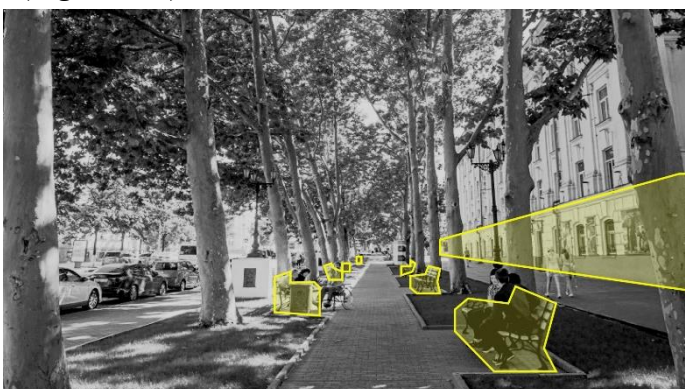


Figure 3.4. Analysis of architectural development

According to the social surveys most residents and guests of the city of Sevastopol like the appearance of the central avenue. This suggests that the development of the aesthetic part of the city does not stand still, but is constantly evolving, updating and improving the visual appearance of the city (Figure 3.5.).

The city of Sevastopol itself is a cultural monument of the country. Therefore, it is not

surprising that there is an extensive number of attractions. However, over time, they all need restoration, as well as proper protection.



Figure 3.5. Photo fixation of the fragments of the Nakhimov Avenue design code

Due to the analyses we concluded that the design code of Admiral Nakhimov Avenue is outdated and needs to be updated by preserving significant historical and socio-cultural elements and introducing modern technologies to improve the aesthetic part and practical use for the citizens and guests of the city.

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ВОПРОСЫ ПРАВОВОГО РЕГУЛИРОВАНИЯ ЭКОЛОГИИ ENVIRONMENTAL LEGAL ISSUES

Аннотация. В данной статье рассматривается потенциал развития экологического права в Российской Федерации, что связано с процессом реализации норм юридической ответственности в сфере охраны окружающей среды. Проводится анализ и оценка зарубежного опыта решения экологических проблем в области природопользования в рамках правового и законодательного поля. Поднимается вопрос что, несмотря на прописанные нормы права экологической направленности, положения Конституции РФ в вопросах об охране окружающей среды требуют совершенствования с точки зрения организационно-правового механизма применения. В связи с чем автор раскрывает возможные перспективы развития государственного законодательства в области экологического права.

Abstract. This paper considers the potential for the development of environmental law in the Russian Federation, which is associated with the process of implementing the norms of legal responsibility in the field of environmental protection. The analysis and evaluation of foreign experience in solving environmental problems of nature management within the legal and legislative field are carried out. Despite the prescribed norms of environmental law, the environmental provisions of the Russian Constitution require some improvement in regard to institutional and legal implementation. The author outlines possible prospects for the development of state legislation of environmental law.

Ключевые слова: экология, право, законодательство, окружающая среда, правовое регулирование, РФ.

Key words: ecology, law, legislation, environment, legal regulation, Russian Federation.

The topic of ecology is meaningful and relevant to the inhabitants of the whole planet. Some ways to solve the problems of excessive non-recyclable garbage, widespread air pollution from industrial facilities, water pollution, deforestation, violence against wild animals, etc. are being constantly explored. Unfortunately, not all countries have the possibility to attack all of the above-mentioned problems. The purpose of this research paper is to analyze the range of environmental issues in law. Consequently, it forms the basis for the preparation of the grounds for new proposals and assumptions concerning the interaction of such different and seemingly unrelated spheres as law and ecology.

The object of the study is ecology and its legal regulation. The subject of this study is the state legislation regulating the field of ecology to an extent that it is sufficient. In order to do so, it is necessary to understand what issues in the regulation remain undisclosed, how the existing problems can be rectified.

To begin with, let's look at what is meant by environmental law, according to Russian scientists. Demichev A.A. and Gracheva O.S. in their work "Environmental Law" states that at the present time in the Russian Federation environmental law is a complex branch of law, which is a set of legal norms regulating relations in the sphere of nature management, environmental protection and environmental safety. Ecological safety is accepted to understand an admissible level of the negative impact of natural and anthropogenic factors of ecological danger on the environment and the person [2, p. 12].

Important questions about environmental issues have also been raised in foreign countries for a long time. Therefore, environmental legislation and the general state of the environment are much better in some countries. For example, having been on the verge of an ecological crisis half a century ago, today Switzerland ranks first in the world in terms of environmental protection. Sweden, where more than 99% of rubbish is recycled and reused in one way or another - a phenomenon already referred to as the 'Swedish recycling revolution'. Scientists such as V. I. Vernadsky, E. H. Heckel, R. Carson, G. W. Carver, and others have conducted research and developed theories concerning the environmental issues.

L. M. Gibbs and K. J. Stults in their work "On Grassroots Environmentalism", published in 1988 declared that "Some environmentalists have criticized the grassroots toxics movement for being crude and selfish. We are sometimes called NIMBYs ("Not in My Back Yard"), as though it is a moral defect to fight for home, family, and children. But now, considerable solutions advocated by the anti-waste grassroot movement - waste reduction, recycling, reclamation, and reuse - have become the common wisdom. We also believe the best way by far to address these issues is to deal with them at the grassroots level. It is believed it is morally right that people directly affected by the problems decide how they will be fought" [5, p. 246].

As we can see the problems and solutions in the field of ecology attracted a great deal of attention even in that period, certain judgments were made on this topic, and some of them definitely influenced the legal position of foreign countries.

Unfortunately, environmental law is a relatively new area of research in Russia. But in spite of this, there are still academics and researches that provide us with insights into the problems and how they can be addressed. For example, A. M. Gilyarov, Yu. N. Kurazhkovsky, V. G. Gorshkov, and others.

A great deal of research on the subject of environmental law in the Russian Federation has been done by S. A. Bogolyubov. He is one of the leading scientists of the Russian Federation in the field of environmental and agrarian law, and he has contributed a significant amount of works in these areas of law. His most prominent and fundamental works include "Environmental Law", "Topical Problems of Environmental Law", "Legal Mechanism to Ensure Rational Use of Natural Resources", etc. Every year S. A. presents something new in the study of ecology from the legal position.

His monograph "Actual Problems of Environmental Law" outlines: "When the few claims of Russian citizens and public associations to limit, suspend and stop environmentally harmful activities, to close shops, enterprises and devices that pollute natural objects, exposing them to spoiling, appeals of citizens to resettle because of adverse habitat are satisfied by the decisions of courts and arbitration courts, they are usually not executed due to lack of adequate housing and material means" [1, p. 51]. Here S.A. Bogolyubov clearly identified the problem that must be solved. It must be done as soon as possible, because we live in a state where everyone has the right to a healthy environment for life and development, which is directly enshrined in the Constitution of the Russian Federation. Legal regulation must be an integral part of ecology.

Also, over the years and with experience, certain trends and instruments have developed that contribute to the development of environmental law.

For example, Strategic Environmental Assessment (SEA) is a methodological tool that is only beginning to be used in Russia, but has been used successfully in other countries for decades. Here is what the author of the article "Overview of the Modern Practice of Strategic Environmental Assessment Abroad" V. E. Pinaev writes on this issue: "Efficient application of SEA is characterized by several key elements: participation of public organizations and associations, quality of SEA

reports, monitoring and integration of the planning process with SEA” [4]. With regard to this statement, we intend to disagree with the author. We believe that the effective application of strategic environmental assessment is something that our state should strive for in order to effectively solve environmental problems.

However, simply collecting general information is not enough. A constructive approach is the main goal of such an assessment, facilitating decision-making to better integration of the environment and sustainable development. SEA is used provide an understanding of the complexity of the decision-making process, the needs and priorities of the project, and helps explore how environmental and sustainability issues can be incorporated into decisions [4]. It is something that all countries strive for, unfortunately, though not many countries can confidently report that they have achieved even just the half of the goal.

People must stop treating nature with such disregard. No one thinks about the consequences of their actions, so it is necessary to make people start to think about them and, moreover, take responsibility for them. This should be spelled out at the legislative level.

There is a need to establish satisfactory control in the field of the environment from a legal point of view. Our country is at a level of prosperity and development where it can afford to take responsibility for solving environmental problems. And to ensure the development of environmental law in the country.

People's level of responsibility rarely reaches a level that makes them think about actions that are not regulated by law in any way. Therefore, it is necessary to establish a clear framework for behavior towards our environment. We would call this a “necessary artificial increase” in the level of public responsibility. We must not degrade ecology in relation to other spheres of our life.

We ourselves create uncomfortable conditions for our future life, as the number of non-polluted territories on the planet is decreasing rapidly every year. But as for ecological crimes, the tendency to commit them is still positive, and we need to fight against it. It is high time that the concept of ecology was perceived not only as a science, but also as a sphere of our life. After all, it includes the relationships and interactions of various living beings and the environment around us. It is what makes our life on Earth possible. We must not neglect our own future and the future of future generations.

We are used to taking everything possible from nature for our existence and in our interests, but only few people think that we should not only take, but also give something in return. It is in our own interests: to live in cleanliness and enjoy the environment, not to breathe dirty air, to watch how the streets are getting dirtier from year to year, the landfills are growing endlessly, the water becomes unusable in its pure form, but only after treatment.

There are countries that are ahead of the curve in environmental law. As time goes by, we too will have to advance further and further in this field of law, but it would be much more useful to do it as early as possible.

Children must be taught from an early age that ecology is a very crucial part of our lives and should be treated with great attention and respect. The future generation should have certain attitudes towards ecology and everything that surrounds them. It is necessary to teach not only to live in a society of people, but also in a “society” with nature. This is one of those issues to which we should begin to pay great attention.

However, it is impossible not to mention the issue of organisations and associations that are set up to carry out activities related to the environment – these are voluntary organisations. Their activities are regulated by law. It is very important that the state seeks to regulate such a necessary process, which in general affects the well-being of the whole state. Overall, it can be concluded that the state is interested in the development of environmental law.

We are at the stage where environmental problems are far from being far-fetched and require certain solutions. Therefore, one of the methods of environmental law is ecologization. S.A. Bogolyubov noted in his monograph: “The method of ecologization can be considered as a manifestation of a general ecological, environmentalist approach to all events and phenomena of

social being, to all aspects of human behavior without exception” [1, p. 33]. That is, every branch of law in one way or another must contain prescriptions to protect the environment.

Our task is to determine how we can fill the gaps in the law, as well as in the reality of its compliance and enforcement.

If we take the basic law of our country, i.e. the Constitution of the Russian Federation, in article 42 we can see: “Everyone has the right to a favorable environment, reliable information about its condition and to compensation for damage caused to his health or property by an environmental offense” [3]. Unfortunately, it is not always possible to comply with this constitutional provision. In this case more specific and practically applicable disclosure of this article is necessary, which is confirmed by works of S.A. Bogolyubov, A.A. Demichev, various scientists, as well as the conducted research using various scientific works.

In resolving such issues, it is best to put morality and law on the same level, that is, law should not be below morality. And in this way to build the legislative regulation of ecology. After all, in such an issue, it is very important to approach the solution of problems from a position as close to a person as possible.

The legal system of the Russian Federation has formulated a sufficient number of normative legal acts, but the problem is that some of them lack a more specific disclosure or method of application. In particular, this is since our state cannot ensure full implementation and compliance with some legislative acts due to certain territorial, material, technical and other features, while at the legislative level this issue can be solved and spelled out very well. It is necessary to create and develop technologies allowing to solve the issues related to environmental problems as quickly and correctly as possible. It is necessary to find an approach to each area of environmental law. Since any prescriptive or prohibitive forms of legislative regulation are not enough everywhere.

As a result of this research work, we have concluded that one of the most common problems in solving environmental issues is the insufficient elaboration of the ecology legislation of the Russian Federation. We realized that the legal regulation in some foreign countries is developed much longer than in Russia. This is the reason for this gap in our country’s environmental law. It is sure that this issue should be considered and investigated more than once since this area requires a great deal of attention.

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**МЕЖДУНАРОДНОЕ СУДОХОДСТВО В УСЛОВИЯХ
ГЛОБАЛЬНОЙ ПАНДЕМИИ COVID-19
INTERNATIONAL MARITIME SECTOR IN A GLOBAL PANDEMIC OF COVID-19**

Аннотация. В статье представлен краткий обзор последствий пандемии COVID-19 для мирового судоходства. Обобщены основные тенденции его работы в контексте принимаемых ограничительных мер в рамках борьбы с новой волной распространения коронавирусной инфекции. Автор выделяет основные решения рассматриваемой проблемы и рассматривает их последующее влияние на глобальную морскую транспортную систему.

Abstract. This article provides an overview of the impact of the COVID-19 pandemic on global shipping. It summarizes its dynamics due to restrictive measures with the spread of novel coronavirus infection. The author highlights the main decision-making solutions and substantiates their further effects on the global maritime transport system.

Ключевые слова: коронавирус, пандемия, ограничения, моряк, международное судоходство.

Key words: coronavirus, pandemic, restrictions, seafarer, international shipping.

The pandemic of coronavirus disease COVID-19 has a devastating impact worldwide on all areas of life – economy, society, education. The infection has spread to more than 200 countries in Europe, Asia, Africa, and the United States, threatening the very existence of the world economy by causing it to stagnate. In the first six months of 2020, the global situation worsened despite the measures taken: the number of cases increased by more than 60.1 million, or 1036%, the number of deaths increased by 1.14 million, or 316%, the number of people cured increased by 43.2 million, or 1800%. Under these circumstances, the shipping industry, as one of the most important areas of the global transport system, could not be left unattended.

To contain the exponential spread of the virus, countries around the world have adopted various measures, such as total isolation, border closures and quarantine. This has caused huge problems for the shipping industry, from reduced global cargo turnover to restrictions on crew members' ability to make the trips [3].

The relevance of the problem under study is due to the fact that the world is currently experiencing the fourth wave of the coronavirus pandemic. Since the last wave, the decrease in the rate of growth of the number of infected people has not been consolidated in the form of gradual and final overcoming of SUS-19, and now the number of infected people in the whole period of the pandemic has exceeded 258 million, of which about 47 million people are in the active phase of disease development. The number of deaths is 5 million.

The main purpose of the study is to identify how the pandemic has affected the global shipping industry and to consider measures to optimise the performance of the entire maritime industry. In this article, various monitoring materials, as well as national and foreign scientific literature, have been used to analyse the problem.

To achieve the main objective of this study, we are going to compile a measure of the response to the pandemic. But first, let's identify some essential aspects of the shipping industry influenced by Covid-19.

Between 2019 and 2020, the number of ship calls decreased significantly, and it applies to all ship types. The table below shows the number of ship calls in the ports of the European Union (EU) per quarter in years between 2016 and 2020 and the trends between different years (Table 1) [4].

Table 1. Number of ship calls between 2016 and 2020 per year quarter

Year / Quarter	Q1	Q2	Q3	Q4	Total	Trend vs previous year
2016	163282	201162	222339	179416	766199	-
2017	164070	192137	220160	176470	752837	-1.7%
2018	161784	200585	224895	177389	764653	1.6%
2019	161846	205460	229441	179727	776474	1.5%
2020	160424	150939	208566	177695	697624	-10.2%

The period between 2016 and 2019 was quite stable. In 2020 we can see that the number of ship arrivals in the 1st quarter of the year was similar to 2019, but the second quarter of the year started a significant drop (26.5%). The third quarter of 2020 still saw a decrease of 9.1% compared to 2019, but the fourth quarter of 2020 was very similar to 2019 (a decrease of only 1.1%) [4].

According to global statistics, all ship types have been affected by the decline in the number of ship calls. Cruise ships, passenger ships and transport carriers are the ship types for which the largest decrease in ship calls in 2020 has been identified. For bulk carriers, chemical tankers, container carriers, general cargo, liquefied gas tankers, oil tankers, Ro-Ro ships and Ro-Ro cargo ships, the decrease between 2019 and 2020 was less than 5% [4]. The most significant decrease occurred in the segments of cruise ships, passenger ships, refrigerators, and car carriers. A noticeable drop in the number of ships calls in the EU began in the 12th week of 2020 (March 16–22), a week after the World Health Organization (WHO) announced the start of the pandemic.

As for the seafarers, many of them were unable to get on board due to the closed borders between the countries. And those who were on board during this period could not return home because the watch crew was not staffed for the reason described above. These workers have been working for 12 months or more. As a result, up to 400,000 seafarers were trapped at sea.

All of this required an immediate response from nations and the global community. On 1 December 2020, the UN General Assembly unanimously adopted a resolution on “International cooperation to address challenges faced by seafarers as a result of the COVID-19 pandemic to support global supply chains” (A/RES/75/17). Indonesia, a key global supplier of maritime labour force,

served as facilitator for its negotiation, supported by UNCTAD, ILO and IMO [1]. Co-sponsored by 71 countries, the resolution among others:

- Urges Member States to designate seafarers and other marine personnel as key workers.
- Encourages governments and other stakeholders to implement the IMO protocols to ensure safe ship crew changes and travel during the COVID-19.
- Calls upon governments to promptly implement relevant measures to facilitate maritime crew changes, including by enabling their embarkment and disembarkment, expediting travel and repatriation efforts, and ensuring access to medical care [1].

Reflecting these calls, in January 2021, more than 600 companies and organizations signed the Neptune Declaration on Seafarer Wellbeing and Crew Change, recognizing their shared responsibility to resolve the crew change crisis [5].

For seafarers, issues at stake encompass a broad range of human rights and applicable labour standards, aiming to ensure that their working and living conditions comply with the Maritime Labour Convention, 2006, and other relevant instruments, guaranteeing their health, safety, security and welfare. According to IMO, as of the end of January 2021, 53 Member States and one Associate Member had signed on to designate seafarers as key workers [2].

Many countries responded to pandemics by imposing bans or restricting travel, causing a downturn in the global economy. Shipping and international transport were inevitably affected by the outbreak of COVID-19. The Crew Change Crisis continues to be a top business and human rights issue, and its implications on seafarers' rights, their wellbeing, and mental health, in particular, has underscored the need for charterers, container cargo owners, and shipowners to work together to ensure human rights are respected across shipping operations. Also, difficulties faced by seafarers in obtaining visas or travel permits to transit countries may further complicate the situation. The impact of the pandemic on the maritime sphere has been one of the most extensive in the financial and labor spheres. This problem is still relevant today. It takes time and compliance with the current rules and the addition of new measures to normalize the situation in global shipping.

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КРИЗИС ПАРТИЙНЫХ СИСТЕМ СОВРЕМЕННОЙ ФРАНЦИИ THE CRISIS OF THE PARTY SYSTEMS IN MODERN FRANCE

Аннотация. В данном исследовании рассматривается возникший кризис партийных систем в современной Франции. Старые партийные системы перестают отвечать запросам населения и времени. В современном мире это становится причиной, почему общество и государство начинают переходить к новым вариантам взаимодействия, к демократизации и уменьшению значимости вертикально направленных систем власти. Франция стала одной из первых стран, в которых произошли очень серьезные метаморфозы в социальной сфере, что привело к кризису партийно-избирательной системы и может также повлиять на расстановку политических сил в других странах. Политическая борьба правых и левых партий во Франции свелась к политическому позиционированию и пассивному противостоянию, поскольку программные и идеологические установки обоих полюсов партийной системы Франции значительно сблизились, расходясь лишь в незначительных нюансах. Дальнейшая эволюция партийной системы Франции во многом будет зависеть от того, какие действия Э. Макрон и его политическая партия «Вперед, Республика!» продолжит принимать.

Abstract. This research provides an overview of the emerged crisis of the party systems of modern France. Old party systems no longer meet the demands of the population and the times. In the modern world, this becomes the reason why society and the state begin to move to new variants of interaction, to democratization and reduction of the importance of vertically directed systems of power. France was one of the first countries to undergo a very serious metamorphosis in the social sphere, which led to a crisis of the party and electoral system and may also affect the balance of political power in other countries. The political struggle of the right and left parties in France was reduced to political positioning and weak confrontation, because the program and ideological attitudes of both poles of the party system in France have significantly converged, diverging only in minor nuances. In general, over the past few years, the French party system has moved from a

traditional bipolar multiparty system to the coexistence of a strong centripetal trend together with a centrifugal one, which has catalyzed the emergence of several centers of power simultaneously in the French party-political landscape. The further evolution of the party system in France – whether it will record the results of the shifts that have taken place or there will be a gradual return to the previous state – will largely depend on what actions E. Macron and his political party “The Republic On The Move!”

Ключевые слова: политические системы, избирательные системы, партия, выборы, кризис.

Key words: political systems, electoral systems, party, elections, crisis.

The research suggests that old party systems no longer meet the demands of the population and the times. In the modern world, this becomes the reason why society and the state begin to move to new variants of interaction, to democratization and reduction of the importance of vertically directed systems of power. France, as a world power, is traditionally regarded as one of the countries whose history has had a significant impact on the political systems of other countries through its foreign as well as domestic policies. France was one of the first countries to undergo a very serious metamorphosis in the social sphere, which led to a crisis of the party and electoral system and may also affect the balance of political power in other countries. A study of these processes can help predict similar processes in other European countries and avoid possible mistakes.

Our research aims to identify trends in the evolution of modern party systems in France through factor analysis. The object of our research is the French party systems. The subject of our research is qualitative changes and trends in the development of party systems in France. During work on our research, we have used historical, comparative, systematic methods of research, factor analysis. As the material for our study, we have used articles related to the transformation processes of the French party systems [1; 2; 3].

The preconditions for these problems were already evident between 1981 and 2002 when control of the French parliament changed hands 6 times from right to left and vice versa, and not once did the ruling coalition manage to retain power after another election [3, p. 36].

In the 1990s, there was a tendency of weakening ideological ties between parties and voters, since at times “narrowness” of their ideologies could not meet the demands of society to solve the variety of new social, economic, political, and spiritual problems. French political parties could not count on the constant support of certain layers of the population. Participation in the elections illustrated the fact that it was difficult for them to catch changes in the sentiments of their supporters. As a result of this process, the French who doubted power began to show electoral mobility, thus strengthening the influence of conjunctural factors on the outcome of the elections [3, p. 36].

At that time, there were contradictory processes in the right-wing camp. Its liberal (centrist) wing was still a heterogeneous association of small groups with relatively abstract membership and a very unstructured vertical of government. The core of the French “right-wing” neo-Governmentalists with whom the majority of liberal-centrists finally merged in 2002, gradually followed the way of creation of the “party voters” of the American type, actively using modern political technologies, methods of political marketing and advertising, analysis of electoral preferences through public opinion polls and mass media.

As a result, the political struggle of the right and left parties in France was reduced to political positioning and weak confrontation, because the program and ideological attitudes of both poles of the party system in France have significantly converged, diverging only in minor nuances.

As for new history, it is safe to say that the 2017 French presidential election marked a new blow to the crisis of traditional political parties: for the first time in the history of the Fifth Republic, neither the Socialist nor the Gaullist candidate was represented in the second round of the presidential

election. As was said earlier, the old political forces proved incapable of adjusting to the new political agenda [1, p. 96].

The main event in this election was the emergence on the French political landscape of a new political force, former Socialist comrade-in-arms and former economy minister in F. Hollande's government Emmanuel Macron. He founded in 2016 the movement "The Republic on the Move!" ("En marche!"), which positioned itself as a "nonpartisan" association that cannot be attributed to either the left or the right side of the political spectrum [2, p. 294].

Macron's political project, in his own words, was aimed at bridging the gap between the right and the left, thus creating a prerequisite for the formation of a qualitatively new pole of power, which would take into account the changes taking place in French society and in the world. Thus, the strategy chosen by the party emphasized the cooperative component rather than the rivalry component, through which the latter managed to attract to its side people from a wide range of political movements.

As a result, the 2017 elections in many respects marked a break with the traditional scenarios of the French electoral process: for the first time, an incumbent head of state did not present his candidacy for the presidential election; for the first time, there were no "natural" candidates among the Socialists and representatives of the Republicans; for the first time, on the eve of elections, four favorites with almost equal chances of making it to the second round emerged at once. All this was the result of a complex of events and changes affecting the main political party players, the most important of which are outlined below [2, p. 295].

In general, over the past few years, the French party system has moved from a traditional bipolar multiparty system to the coexistence of a strong centripetal trend together with a centrifugal one, which has catalyzed the emergence of several centers of power simultaneously in the French party-political landscape.

In addition to the identity crisis within political parties and the unresolved problems within the state that directly affect the political choices of French voters – issues related to security on French territory, the integration of immigrants, unemployment issues – the metamorphosis that has affected the French party system is largely due to the obsolescence in French society of the right-left dichotomy as such. New generations of French voters do not tend to identify themselves as adherents of a particular ideology, which is certainly a challenge for traditional parties, which are forced to reconsider their ideological platform in order to comply with the spirit of the times.

The further evolution of the party system in France – whether it will record the results of the shifts that have taken place or there will be a gradual return to the previous state – will largely depend on what actions E. Macron and his political party "The Republic On The Move!" will continue to take. It also depends on the support of Macron by other representatives of the political and economic establishment both inside and outside of France [2, p. 295].

Prospects for further research depend directly on the current events in the world. The research is relevant for a comparative analysis, which will allow us to find similar processes in the evolution of the party systems of other European countries.

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СРЕДНИЙ КЛАСС КАК ОСНОВА ГРАЖДАНСКОГО ОБЩЕСТВА THE MIDDLE CLASS AS THE BASIS OF CIVIL SOCIETY

Аннотация. Основу любого государства составляют люди и их взаимоотношения. Человек осуществляет свою деятельность и неизбежно становится источником различных изменений как своей жизни, так и окружающего мира. Государство же является центром развития человека и народов, поскольку создаёт условия для их выживания, благоприятного существования и развития. В итоге источником создания государства все равно становится группа людей, которая пришла к решению создать определенную систему взаимоотношений на основе всеобщего правопреемства и идентичности. Такую социальную единицу мы называем общество. Под влиянием крупных исторических событий и крупных трансформаций, а также переосмыслением самой сути существования государства, возник новый этап развития – гражданское общество. Осознание человеком его личной социальной ответственности, а также его роли в развитии государства привело к переосмыслению понятия общества как социокультурной единицы. XX век показал небывалый ранее экономический, технологический, научный рост, который привел к росту благосостояния населения и укреплению капиталистического строя. В этой стремительно изменяющейся среде возник средний класс, слой, наиболее мотивированный участвовать в социально-политической жизни государства и который неизбежно становится примером и основой развития общества.

Abstract. The basis of any state is made up of people and their relationships. A person carries out his activities and inevitably becomes a source of various changes both in his life and in the world around him. The state is the center of the development of man and peoples, since it creates conditions for their survival, favorable existence and development. As a result, the source of the creation of the state is still a group of people who have come to the decision to create a certain system of relationships based on universal succession and identity. We call this social unit a society. Under the influence of

major historical events and major transformations, as well as a rethinking of the very essence of the state's existence, a new stage of development arose – civil society. A person's awareness of his personal social responsibility, as well as his role in the development of the state, led to a rethinking of the concept of society as a sociocultural unit. The XX century showed an unprecedented earlier economic, technological, scientific growth, which led to an increase in the well-being of the population and the strengthening of the capitalist system. In this rapidly changing environment, a middle class has emerged, a stratum most motivated to participate in the socio-political life of the state and which inevitably becomes an example and the basis for the development of society.

Ключевые слова: гражданское общество, средний класс, государство, общественные интересы, права и свободы, самоидентификация.

Key words: civil society, middle class, state, public interests, rights and freedoms, self-identification.

Over the course of many centuries, society has significantly transformed under the influence of the eternal rivalry between the “elite” and “lower” strata. However, an important feature of this rivalry was the fact that the “elite” stratum was always in the minority, only the forms of despotism over the “base” stratum changed. By the end of the 18th and the beginning of the 19th century, significant events took place in history that began to erode this eternal class struggle and led to the emergence of the concept of “equality”, “freedom” and “brotherhood”. The Great French Revolution became a powerful impetus for the emergence of a new form of society, which we now know and observe in many countries of the world. The strong process of institutionalization of new traditions, principles and rules in society, and, as it should, in the state, since it is society that shapes its true appearance, has led to the systematic consideration and application of the term “civil society”.

The concept of “civil society” is currently rather vague, since scientists and researchers do not come to a common opinion on what exactly we call civil society. In our opinion, civil society is an interconnected system of socio-political relations and institutions, expressing certain needs, interests and values of society, interacting with state institutions and realizing civil rights and human freedoms. It should be noted that, despite the inherent forms of interaction, this system is autonomous and independent of the government.

In a historical context, civil society has emerged for many reasons. Among the most obvious are:

- Formation of a nation state;
- Rapid scientific and technological progress;
- Improvement of the general standard of living of the population and its education;
- Establishment of long-term international relations and connections;
- Stagnation of the “elite”, conservative strata represented by the autocratic system;
- Imperfection of legal mechanisms;
- The detachment of state bodies from the problems of the “lower strata”.

According to S.G. Chukhin, civil society is not only a set of certain principles and laws, it is a qualitative state of social processes in a particular state, the obvious characteristics of which are: socio-political activity, awareness of universal legal dependence, creation of legal institutions, expression, first of all, of national, and not personal interests, independence and self-regulation of activities without state intervention [5].

On the basis of the outlined fundamental features, it is possible to identify the main mechanisms that lead to the natural formation of civil society: the implementation of human rights and freedoms, democratic institutions, separation of powers, socio-political pluralism, elected government bodies, a developed system of self-government, social orientation of the state. Thus, despite some autonomy of civil society, the state plays a significant role in its formation, which creates the mechanisms, conditions and legal basis for its emergence.

Civil society is one of the most important elements in the system of checks and balances, which makes it possible to restrict and control the activities of state institutions through appropriate mechanisms, preventing violation of the law and excessive interference in the private life of citizens. Its necessity for the state consists in the destruction of legal nihilism in society, the consolidation of the democratic principles of the state, the development of society in the socio-cultural sphere.

As the most banal example, civil society can predetermine the appearance and development of its state through elected bodies, where their representatives defend the most important interests of both a particular person and society as a whole. Rallies, picketing, processions, voting, observation, realization of rights and freedoms – these are the main forms of manifestation of civil society. The degree of its influence will be determined by people in this social and legal system, who will be most active and influence the life of society and the state. Representatives of the "middle class" are the main "screws" of this complex mechanism.

The middle class, according to the classification of N.E. Tikhonova, is a set of social strata of the population, occupying an intermediate position in the stratification system of society between the lower class ("poor") and the upper class ("rich"). Therefore, one of its main functions is to maintain stability and reduce social tension. The more representatives of the middle class, the less likely it is that negative changes will occur in society, for example, interethnic hostility. It is the middle class, as the most active social stratum, that determines the quality of the country's human potential and is its main innovator [4].

Returning to history, it can be noted that the middle class was formed not under the influence of major historical events, although they played a certain role, but as a natural process of the development of civil society in the implementation of basic human rights and freedoms. The middle class is nothing more than the result of the struggle between the "elite" and the "lower" strata and the compromise of society on the basis of the principle of "equality", only not from the point of view of the law, but from the point of view of social status.

It is also worth noting that the middle class, in the ordinary sense, has always existed. Considering that people whose social and material status are determined to it, allows us to say that they are "not poor, but not rich either", we can confidently assume that a certain stratum of society in each period of history had such a feature. However, modern scientific theory does not simply consider the issue of attributing people to the middle class, but classifies it according to different characteristics and degrees of influence in each state.

The middle class is one of the main sources for the formation of civil society, since its representatives have a certain material and intellectual capital. This social stratum has a whole set of specific characteristics: a sufficient level of income, ownership of real estate, a high level of education and qualifications, satisfaction with social status, interest in maintaining social order and stability. However, these characteristics are not exhaustive, and scientists have not come to a common opinion.

Why is the middle class considered as the most active stratum of civil society? In our opinion, it, being in the system of social relations at the middle level between the class of "rich" and the "poor", exists in conditions due to which it is the most active. These conditions are quite simple: the stratum of the "poor" strives to get out of the current situation as soon as possible and have all the conditions for a decent standard of living, and the stratum of the "rich", in turn, does not want to lose their material and social position, which they have achieved. And the middle class, being in between, has these two motives at the same time – it seeks to improve its conditions and, at the same time, does not want to lose what it already has. This creates a certain incentive among its representatives to as much as possible to defend their rights, social guarantees and demand an improvement in their situation. Therefore, we agree with the researchers A.A. Klimova and A.D. Govorova that the middle class is becoming an example for everyone, demonstrating maximum concern for the current situation and defending the interests of all strata, which undoubtedly leads to the consolidation of the interests of the entire society.

It is also a very significant fact that the middle class is also an example to follow. Through social networks, slogans on the Internet, on the street or other forms of communication, they can reflect positions and views on specific events in society. That is why independent critics and

columnists are very popular in the United States, for example, Ben Shapiro or Andrew McCarthy, who express their opinions in the form of lectures to university students on the most problematic issues in society. Public discussions of this kind form a complex way of thinking and attitudes among potential and real representatives of the middle class, which leads to a rethinking of current socio-political trends and the adoption of certain civil decisions in the future.

Self-identification of a person to the middle class is one of its most important characteristics. The answer to the question “Am I a member of the middle class?” completely subjective. This is due to the fact that in each individual state, the middle class is the people with different values and views, due to the social, economic, political and cultural levels of development [4]. For example, in the Scandinavian countries, the fundamental characteristics for self-identification are social status, profession, prestige and career growth. In the CIS countries – wages, the availability of real estate, a car, good clothes and a good education. In Europe, the characteristics include, first of all, the prestige of the profession, career growth, high material wealth and a good education. Thus, taking into account the socio-political environment of a person and the characteristics of his state, his desires, aspirations and priorities are determined according to them. All this complicates the study of the middle class, which requires adaptation of research in each individual state.

This fact is important, since an indicator of the size of the middle class is the activity of people of various strata – if the turnout in the elections is 100% of voters, this does not mean that all citizens are representatives of the middle class. This fact indicates a high number or high activity of their true representatives; therefore, it seems almost impossible to determine the real number of this stratum.

For the development of an active civil society, it is extremely important for the state not to form a middle class on the basis of material well-being, but to provide conditions in which a person could define himself as a representative of the middle class, while being in the social environment both rich, poor and middle-income. Therefore, the self-identification should be a natural process of a person's awareness of his role and capabilities, as well as influence in making specific decisions. For example, in countries where there is a high level of fraud during elections, the size of the potential middle class is declining due to lack of confidence in the electoral process and, as a consequence, the realization that “my vote doesn't mean anything anyway.” However, this situation can be turned in the other direction, where falsifications are simply impossible – after all, the more real voters cast their votes, the more difficult it is to manipulate votes and fight with public opinion. Such a confrontation between society and the state speaks of a highly developed civil society and a high number of the middle class, which do not allow their activity to violate the established rules and laws.

If we take the middle class in the United States as an example, we can see that it itself is divided into strata, which are expressed in the social status and level of education of a person. Due to such a complex structure within the layer itself, the following problem appears – American families with an annual income of 40 to 95 thousand dollars, who consider themselves to be in this class, live completely differently from what they would like – from paycheck to paycheck, trying to save even at minimal cost. In the classical sense, the middle class does not exist in the United States. The middle class in America is more of a state of mind and imagination. The state has created legal conditions, and society has established certain relationships, which allows people with very different material conditions to be equal in the socio-political system [3].

A rather interesting situation is observed in Norway, where the middle class is practically the entire population of the country. Since the socialist system of society and high taxes do not provide a great opportunity for the accumulation of a large economic condition, citizens are in a certain social and material equality, although this does not at all exclude the division of society into a stratum of “poor” and “rich”. It so happened in the state that no matter who you are – “poor”, “rich” or “average” – you realize your importance, your influence and opportunities, you realize the fact that only you decide your destiny and everything depends only on you. Therefore, representatives of these strata live in a certain balance and equality based on the basic principles of rights, freedoms and obligations. As a result, the turnout in the parliamentary and presidential elections has not dropped below 85% over the past decade, which is an excellent result for a democratic state.

In Russia, belonging to the middle class is determined by social and economic characteristics, among which: the level of income is above average, the presence of immovable and movable property, higher education [2]. The level of stability of a society depends on the share of the middle class, since the larger its number, the more stable it is. Therefore, its number should be the most numerous. According to RBC, the size of the middle class in Russia is only about 15%. In our country, there is too large an economic and social gap between the “rich” and the “poor”, which leads to the problem of self-identification. At the same time, the self-identification of the “middle class” in Russia is not a guarantor of its involvement in the socio-political process, it is mostly a social status, expressed in material wealth and opportunities. The main problem of modern civil society in Russia is that the legal institutions created by the state do not have much support among the population of the country and, as a result, distrust of the results of the electoral process, the growth of opposition forces, the predominance of personal, selfish interests over public ones. Therefore, we agree with the opinion of V.N. Bobkov that if measures are not taken to develop the middle class, in the near future economic and political modernization in Russia will not receive the necessary social support [1].

Thus, we can conclude that the middle class is the basis of civil society. Civil society, as a qualitative state of society, is the determining link in creating the image of the state, its structure and development. And the middle class, being a component and product of civil society, becomes the main support, incentive and driving force in this system. At the same time, a member of civil society is a person who defends certain social relations, while any person who defines himself as such can become a representative of the middle class, but this does not mean his involvement in the socio-political process. Therefore, it is very important for the state to create conditions and mechanisms under which the middle class would remain involved and the most active layer of civil society.

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СОВРЕМЕННЫЕ ПОДХОДЫ К ИЗУЧЕНИЮ ОПУСТЫНИВАНИЯ MODERN APPROACHES TO THE STUDY OF DESERTIFICATION

Аннотация. В работе рассмотрены несколько современных подходов к изучению опустыненных и подверженных опустыниванию земель в условиях изменяющегося климата. В целом в современной концепции опустынивание рассматривается как следствие цикличности аридизации климата естественного происхождения. При этом в фазу усиления аридизации последствия антропогенной деятельности становятся более заметными. Принимая это во внимание, мы можем регулировать интенсивность ведения сельского хозяйства в определенную фазу климатической аридизации. Эколого-экономический геоинформационный мониторинг и косвенно система дистанционных индикаторов опираются на описанное выше взаимодействие природно-антропогенных систем. Таким образом, информация, полученная путём применения данных подходов, может использоваться для принятия определенных мер в борьбе с опустыниванием.

Abstract. The paper considers several modern approaches to the study of desolate and desertification-prone lands in a changing climate. In general, in the modern concept, desertification is considered as a consequence of the cyclical aridization of the climate of natural origin. At the same time, in the phase of increasing aridization, the consequences of anthropogenic activity are more noticeable. Taking this into account, we can regulate the intensity of farming in a certain phase of climatic aridization. Ecological and economic geoinformation monitoring and indirectly the system of remote indicators is based on the interaction of natural and anthropogenic systems described above. Thus, the information obtained through the application of these approaches can be used to take certain measures to combat desertification.

Ключевые слова: опустынивание, аридизация, изменение климата, современные подходы, эколого-экономический геоинформационный мониторинг, система дистанционных индикаторов.

Key words: desertification, aridization, climate change, modern approaches, ecological-economic geoinformational monitoring, system of remote indicators.

The problem of desertification started to be considered on global scale after the UN Conference in 1977 (Kenya, Nairobi). The reason why the problem was brought forward for international discussion was the difficult socio-economic situation in 1960s in some African countries located in the Sahel zone. Nowadays it is obvious that desertification is one of the major environmental, social and economic problems. In our country, the problem of desertification developed during the plowing of virgin and fallow lands in the 50–60s of the 20th century. According to the current available data the Russian area of degraded lands has grown for twenty years by more

than 1.6 times and amounted to more than 100 million hectares of desert and desertification-prone lands. More than half of the population of country lives here and more than 70% of agricultural products are produced [4]. Nowadays, the problem of desertification is often considered in the context of climate change, which makes it even more urgent. In this regard, new approaches have emerged to monitoring the dynamics of desertification. The purpose of this study is to give an overview of several modern approaches to combating desertification.

The modern approach to the study of the problem of desertification involves, firstly, considering the cyclical aridization of the climate to be of natural origin [2]. During the period of natural aridization in arid and semi-arid areas the traces of stronger or weaker anthropogenic activity become more visible. This means that excessive anthropogenic load on more vulnerable arid soil at that time can cause more significant damage and even make the arable land completely unsuitable for agriculture. Secondly, in addition to certain phases of aridization, it is necessary to take into account the processes of weathering and water erosion, soil salinization, and sparseness of vegetation cover. In accordance with this approach, taking all the above-mentioned factors into account, anthropogenic activities can be organized more rationally if the farming intensity is adapted to the phase of climatic aridization. Moreover, the control of anthropogenic load can reduce the probability of desertification leading to irreversible changes in the landscape. This in turn can impede loss of arable land and decline of the local economy in the long-term perspective. The method can not only help scientists track the direction of desertification processes, but also fully reveal the causes of the desertification process in places where it has never happened before.

Ecological and economic geoinformational monitoring of agricultural landscapes takes into account many aspects mentioned above and allows scientists to analyze major degradation processes, develop a set of ecological and economic criteria to assess anthropogenic factors influencing degradation of agricultural areas and conduct ecological and economic zoning [3]. In the framework of monitoring, cartographic and mathematical models are created and analyzed in three temporal perspectives: pre-agricultural state of the land under consideration, modern degraded state and improved state (after possible processes of restoration or rehabilitation applied to the land). Such scheme allows assessing the current state of arable land and identifying trends in the dynamics of desertification in the future, as well as choosing the best techniques of reversing desertification processes in the area under study. If we consider the processes of desertification in the Eurasian steppes, in particular in the Republic of Tyva, we can find that they were largely caused by abrupt changes in land use due to socio-economic transformations in the country [4], and here it is necessary to pay great attention to the disengagement and correlation of various types of farming methods in the past.

Another approach to studying the dynamics of desertification is a system of indicators. Indicators are classified into geobotanical, soil and remote ones. Each group of indicators includes some certain aspect like, for example, vegetation cover of soil (geobotanical indicator), the intensity of erosion (soil indicator), the depth of ground water level and mineralization of groundwater (soil salinity indicator), the shade and color of the image, the area and shape of contours (remote indicators of desertification) [5]. To highlight that only the application of the entire system of indicators, rather than a reliance on one or two separate features, will provide enough accurate information about the pattern of desertification processes.

To conclude, it is possible to say that desertification is one of the major environmental processes requiring quick responses so that not to lose arable lands completely in some areas. Modern approaches to monitoring the dynamics of desolate and desertification-prone lands take into consideration a wide range of both climatic and anthropogenic factors, which getting the most accurate information about the current and future state, of arable lands and find the most rational and efficient ways to stop or reverse desertification in certain areas.

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АНГЛО-САКСОНСКАЯ ПРАВОВАЯ СИСТЕМА: ОБЗОР ИСТОРИИ И РАЗВИТИЯ ANGLO-SAXON LEGAL SYSTEM: REVIEW OF ITS HISTORY AND DEVELOPMENT

Аннотация. Данная статья рассматривает развитие и строение Англо-Саксонской правовой системы. Рассматривается географическое деление данной системы на две семьи,

структура права английских колоний в Северной Америке, отсутствие деления на частные и публичные законодательства. Также изучаются законодательные нормы, такие направления, как юрисдикция справедливости, общее право. Отмечается специфика правового влияния Англо-Саксонской системы на континентальные страны, ее отличительные черты, достоинства и недостатки. Большое значение уделяется рассмотрению этапов исторического развития данной системы с времен завоевания Англии нормандцами в 1066 году, затем в период становления власти Тюдоров, в период расцвета и упадка юриспруденции в Англии и до наших дней. Также внимание уделяется таким важным частям Англо-Саксонского права, как юридические прецеденты, нормативные акты, обычаи.

Abstract. This article examines the development and structure of the Anglo-Saxon legal system. The geographical division of this system into two families, the structure of the law of the English colonies in North America as well as lack of division into private and public law are examined. There are also studied legislative norms, such areas as equity jurisdiction and common law. The specifics of the legal influence of the Anglo-Saxon system on the continental countries, its distinctive features, advantages and disadvantages are noted. Considerable attention is paid to the stages of the historical development of this system from the time of the Normans' conquest of England in 1066, then during the formation of Tudor power, during the heyday and decline of jurisprudence in England and up to the present day. Attention is also given to such important parts of Anglo-Saxon law as legal precedents, statutes and customs.

Ключевые слова: Англо-Саксонская правовая система, судебный прецедент, юридическая доктрина, закон, нормативные акты.

Key words: Anglo-Saxon legal system, judicial precedent, legal doctrine, law, legal acts.

The Anglo-Saxon legal family is one of the most popular legal systems in the world. About a third of the world's population uses its principles in lawsuits. It is widespread in the UK, USA, captures New Zealand, Australia, as well as used in Northern Ireland and other countries. Geographical division distinguishes two categories of the Anglo-Saxon legal family. The United Kingdom and the Commonwealth states belong to the English group, and the legal structures of the United States are an example of the American group. Each has its own characteristics.

The structure of the law of the English colonies in North America of the XVI–XVII centuries developed differently from the United Kingdom of Great Britain and its colonies. The legal similarity of the colonies with the former metropolises is still preserved. The world community believes that the United States and Great Britain are divided among themselves by the rules of common law.

The Anglo-Saxon system has certain signs. Judicial precedent is recognized as the main legal source, the concept includes behavioral principles formed by the arbitrators of the court when pronouncing verdicts in each case, and applied to similar cases. The main role in generating jurisdiction is assigned to the judicial system, which occupies a dominant position in the structure of the state. Consideration of issues is conducted taking into account the rights of citizens, not their duties. The powers of a person are protected through judicial procedure. Priority is given to procedural law (evidence base, procedure), on which the material advantage largely depends. There are no classified legal branches that regulate the same type of public relations by peculiar legal methods. The statutory set of legal norms is being widely developed. This area includes local self-governing bodies with a hierarchy when legislative acts are recognized as more effective than executive procedures. Legal practices act as additional or auxiliary accumulators. Legal structures differ in their applied and practical nature.

The English Law Group differs in that it has a trust institution. This is a general management structure, when the constituent property is placed at the disposal of a trustee, and the income goes to

the beneficiary. At the same time, the privilege of property is not determined by the framework of jurisprudence, but is limited by the moral rights of citizens.

The Anglo-Saxon legal system is not divided into private and public legislation, which are characteristic of other systems. The structure is not divided into legal and general social jurisprudence, as it is not divided into classical branches. There is no differentiation into commercial, administrative, civil and criminal law. Branch institutes are not grouped according to monotonous legislative norms and are not divided into dispositive and imperative legal canons. Imperative laws are expressed in a certain form when the norms are not changed at the initiative of applicants. The method of legal regulation with the possibility of contractual coordination of options by the subjects of the development of relations is considered dispositive. Legislative norms are aimed at solving problematic situations, and not at defining general principles of behavior in the future. English jurisdiction is not qualified by industry, is not a codified set of laws, but the provisions are combined and systematized on the same type of issues into general acts [1].

The division of the legal branch of the Anglo-Saxon family is influenced by the historical characteristics of the development of the judicial system in England. Royal courts took part in the creation of common law provisions, and the canons of legal justice were laid down in history by the system of the Lord Chancellor. English law is divided into two directions: the law of edit and common law. The first direction means a collection of traditional laws that are applied in the model of jurisprudence as a supplement to those canons perceived as too rigid. Most often, the law of edit is used within the framework of civil legal relations and allows for a freer interpretation of codes. The clerical court cannot overturn the decision of the Court of Law, but passes a sentence that makes it impossible to execute the decision. Such verdicts are not considered legal in full, but comply with the laws of justice. Precedent legality is formed on the basis of canon and Roman law.

The specifics of the legal influence of Great Britain can be traced in continental countries, where laws are formed by the authorities and adopted after the issuance of government and executive decisions. General structures attach importance to judicial sentences, which are perceived as a source of law of the Anglo-Saxon legal family along with the laws of the government. The law has distinctive disadvantages in the form of casuistry, formalism and a whole list of contradictions.

Anglo-Saxon jurisprudence was formed during the main four periods. Before the Norman conquest of England in 1066, there was no general legislation in the country. The main source of law existed in the form of local traditions, which had similarities and differences depending on the area. The next period of the formation of the Tudor power (1066–1485) was characterized by the centralization of the state, the appearance of the initial makings under the name of general laws. The legal regulations were established by the royal court. From 1485 to 1832, the country experienced alternately the heyday and decline of jurisprudence. The norms began to lag behind reality, and cumbersome legislation reduced the efficiency of work. As a result, the provisions of the law of justice arose, the foundations of which were formed by the office of the lord. From 1832 to the present day, after the judicial reform, arbitrators have been able to make decisions at their discretion, taking into account the canons of common law and the beliefs of justice. When making decisions, the experience of meetings in the past and the arbitrators' own understanding of justice were taken into account [2; 3].

Some scientists give equal opportunities to the source and the specific form of expression of law, others contrast these two concepts. For the latter specialists it is an obvious fact that the source helps to create legal norms, and the expression is perceived as a collection of standards that, in fact, do not coincide with the source. The root causes of Anglo-Saxon law include court precedents, regulations (charters), customs, and legal doctrine. The primary cause reflects the state's will to recognize the existence of legislation. Sometimes confirmation of ancient traditions for a certain area is required along with administrative or judicial decisions.

In the countries of the Anglo-Saxon legal structure the concept of judicial precedents refers to the sources of law. Proceeding from the hierarchy of precedents, decisions of higher organizations (the British House of Lords) are binding on lower courts. Some precedents are not binding, but they play an important role in determining the resolution at the meeting. Judicial norms are divided into

legislative rules and precedents. The general legal norms represent a part of the court verdict of the highest instance and represent a legal conclusion on the case. The precedent serves as a model for further court decisions in subsequent periods. The judicial case acts as the source of the law, which is implemented through it. The Anglo-Saxon structure is distinguished by the fact that the power to make precedents belongs to the highest courts, and the courts are obliged to draw conclusions from the verdicts of the highest instances.

By-laws and charters are also the source of the Anglo-Saxon legal structure. The priority of the statute over the precedent is manifested in the fact that the first one cancels the second one if necessary. The UK does not have a textual constitution, but there is a set of legislative norms regulating the duties and rights of citizens.

Normative acts are considered a legal source after they are carried out in judicial practice. They belong to the auxiliary category, because they complement judicial precedents. Customs also refer to sources, but their validity was limited to the period of application only until 1188.

Within the classical theory of England, the regulatory legislation is considered to be only a secondary legal reason which introduces some amendments to the jurisdiction formed on the basis of judicial practice.

Legal theory was originally the root cause of legislation and was expressed in the works of the Dutchman G. Grotius and Anglo-Saxon lawyers. The doctrine is divided into an official paradigm, which is formed taking into account national interests and scientific approaches arising in universities.

International law in the theory of doctrine is based on the canons of the natural law school. Positivism led to a decrease in the importance of doctrine, and then to a reassessment of the role of legal theory in jurisdiction. Currently, the doctrine is considered as a subsidiary legal source, which is used in certain circumstances. Obligations under the agreement may be paid by another person if the former is unable to do so.

The legal doctrine is a conceptually complete thought and its importance increases [4]. Law schools are being opened in different universities of the Anglo-Saxon countries. The advantages are that some texts are used everywhere and serve in solving specific cases.

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**СРАВНИТЕЛЬНЫЙ АНАЛИЗ РЫНКОВ ТРУДА
ЮГО-ВОСТОНОЙ ИРЛАНДИИ И ЮЖНОЙ КОРЕИ
COMPARATIVE ANALYSIS OF SOUTH-EAST IRELAND AND SOUTH KOREA
ABOUT MARKETS**

Аннотация. В данной работе проводится сравнительный анализ рынков труда Западной Европы и Дальневосточной Азии на примере таких стран, как Юго-Восточная Ирландия и Южная Корея. Рассматриваются основные современные тенденции развития мирового рынка труда, присущие вышеуказанным странам, в разрезе исторического, культурного и экономического аспектов. Особенно автор отмечает такие ключевые тенденции, как старение населения, уровень участия в рабочей силе, уровень молодежной безработицы, гендерные различия в оплате труда и количестве управляющих должностей, занимаемых женщинами, уровень долгосрочной безработицы и неполной занятости, размер минимальной оплаты труда, продолжительность рабочей недели. На основании проведенного анализа делаются выводы об основных индикаторах состояния рынка труда и их влиянии на текущее состояние экономики.

Abstract. The paper carries out a comparative analysis of Western Europe and Far East Asia labour markets on the example of such countries as South-East Ireland and South Korea. It considers main trends of world labour market development that are inherent to above-mentioned countries in terms of historical, cultural and economic factors. The author points out such key tendencies as aging population, labor force participation, youth unemployment, gender gap in wages and the number of managerial positions held by women, long-term unemployment and underemployment, the minimum wage, the length of the working week. On basis of conducted analysis, conclusions are made about the main indicators of the labor market condition and their impact on the current state of the economy.

Ключевые слова: рынок труда, основные тенденции развития, сравнительный анализ, Юго-Восточная Ирландия, Южная Корея.

Key words: labour market, main trends of development, comparative analysis, South-East Ireland, South Korea.

Labour market is one of those economic markets we can explore permanently, and corresponding studies will always be actual in sense of its purpose. This issue can be explained by the dynamic of world labour market development: every single day we observe how technologies and trends replace each other, creating new job opportunities in one field and taking it away from another. These factors, in turn, cause necessity in retraining and discovering new approaches to recruitment, distribution, and managing labour force. It clearly reflects how changing the labour market is and why it requires constant monitoring.

Since dynamics and flexibility are obvious features of modern labour markets, comparative analysis of such polar countries as South-East Ireland and South Korea represents an essential scientific value, especially in the context of opposite historical and geographical bases of development.

Before conducting analysis of how these countries' labour markets work, we should understand what conditions they were in during the forming process of certain tendencies and what path of economic development they followed. The Ireland South East Development Office's "Economy at a Glance" Summer 2019 report shows a region that had been growing steadily over the previous 7 years across all key economic indicators [2]. Ireland belongs to those countries, which show fast and rapid growth, that's why it is called the "Celtic Tiger". The same situation is typical of Korea, which, in turn, is one of 4 Asian tigers including Singapore, Hong Kong and Taiwan. However, Korea has already experienced a peak, and now it is growing at a rate of about 3% [3] per year. Moreover, both countries had become dependent on trade and grown significantly through investment in high technology, what has influenced the development and structure of the labour market.

Let's consider key economic indicators of labour market functioning:

1) In Ireland, unemployment has been falling steadily on an annualized basis since 2012, but it still remains high by global standards. The situation returned to normal in 2018, when the unemployment rate crossed a plateau of 7% and began the gradual declining (to 4.8 in 2020, respectively) [1]. In Korea, the annual unemployment rate has remained low since 2002 (less than 4%) and hovers around at about 3.5% [3] of the total workforce.

2) As for the comparative characteristics of unemployment by gender, the level of unemployment for men in Korea was higher than for women between 2000 and 2018. However, this gender gap has declined over this period, and there are no significant gender differences anymore (Table 1). In Ireland, we observe the same trend. Unemployment rate for men and women was falling steadily, and accounted for 5.2% and 5.4%, respectively, in 2019 (Table 2) [5].

Table 1. Unemployment rate by sex, %

Year	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019	2020
Men	13.1	12.1	4.1	4.4	17.0	10.7	9.0	7.0	5.7	4.9	5.1
Women	14.1	12.2	3.6	3.5	11.2	8.9	7.5	6.0	5.2	3.8	4.5

Table 2. Unemployment rate by sex, %

Year	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019	2020
Men	2.9	2.3	5.0	4.0	4.0	3.6	3.8	3.8	3.9	3.9	3.9
Women	1.8	1.7	3.6	3.4	3.3	3.5	3.6	3.5	3.7	3.6	4.0

3) Long-term unemployment rate is low in both countries. In South-East Ireland long-term unemployment fell sharply from 10% in 2012 to 2% at the end of 2018 [1]. In Korea, the long-term unemployment rate has remained at the level of one percent for almost a decade.

4) One more important effectiveness indicator of the labor market functioning and social protection of citizens is the level of youth unemployment. In Korea in 2018 this figure reached 9.5% [3], which is still lower than in most European Union (The EU) countries, where high youth unemployment has become a chronic social problem, but it's still not low enough and causes certain concerns about the condition of the Korean economic environment. Ireland, being a part of the EU, also suffers because of chronic high youth unemployment rate. Over the past five years this figure

ranged from 12.4% to 15.7% [1] in the crisis of 2021 (not adjusted for the coronavirus).

5) In terms of labor force participation, the average participation rate for both countries is 60% [1; 3].

6) Let's consider the minimum wage rate. For South-East Ireland, in real terms, over the entire period, the NMW (national minimum wage) increased by only € 1.75, or 31%, from € 5.58 in 2000 to € 7.33 equivalent in 2019 [6]. In Korea, a similar increase occurred over the decade, but started not with 5, but 3 euros in 2010. It grew to 6.3 in 2021, respectively [3]. Most often the minimum wage is received by people in unclaimed sectors of the economy, youth, migrants and persons engaged in illegal work.

7) The gender income gap and the number of women with managerial responsibilities should be noted. Looking at the long-term trend, women's earnings came close to men's, with some setbacks in 2014 and 2015. Despite this gradual convergence, the gender income gap in South Korea is large and has never been below 30% (Table 3) [4]. Besides gender discrimination, lookism is common.

Table 3. Gender wage gap in South Korea, %

Country	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Korea	39.61	36.56	36.30	36.60	36.65	37.18	36.67	34.63	34.11	32.48	31.48

If we consider Ireland, it's seen that the gender wage gap is much lower and continues its declining, but still stays quite high (Table 4).

Table 4. Gender wage gap in South-East Ireland, %

Country	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Ireland	14.35	...	...	...	10.61	...	...	...	8.28	...	...

Central Statistics Office (CSO) today shows that three in ten (30%) (Table 5) [1] of senior executives in large businesses in Ireland are female. And only one in 10 managerial positions in South Korea are held by women [3]. The gaps are high, causing low rate of economic participation and opportunities for women.

Table 5. Persons aged 15 years and over in employment (ILO) classified by sex and occupation (SOC 2010)

000'								
Broad occupational group	Q4 18	Q3 19	Q4 19	Q1 20	Q2 20	Q2 20	Q2 20	
Males								
1.	Managers, directors and senior officials	120.8	119.2	125.6	121.5	119.0	121.9	130.2
2.	Professionals	210.4	221.4	226.7	234.5	241.5	227.8	237.1
3.	Associate professional and technical	153.9	161.7	159.2	159.4	159.8	166.3	163.3
4.	Administrative and secretarial	47.5	50.2	50.4	55.2	58.6	58.0	58.3
5.	Skilled trades	297.2	278.5	285.7	285.6	258.2	277.0	265.8
6.	Caring, leisure and other services	39.3	44.4	44.3	38.9	37.8	39.8	36.7
7.	Sales and	69.6	72.6	73.3	71.0	64.2	71.9	75.3

	customer service							
8.	Process, plant and machine operatives	147.7	160.4	158.8	161.2	145.0	146.0	145.3
9.	Elementary	137.0	147.0	144.5	139.0	118.8	135.1	129.8
	Other/Not stated	7.9	*	*	*	*	*	*
Total males	1,231.3	1,260.1	1,273.1	1,270.6	1,206.1	1,246.3	1,245.2	
Females								
1.	Managers, directors and senior officials	67.4	67.1	63.7	67.5	62.5	67.4	69.8
2.	Professionals	258.5	261.9	268.9	274.9	275.6	259.8	261.2
3.	Associate professional and technical	114.6	112.6	115.6	113.1	122.7	123.0	126.9
4.	Administrative and secretarial	168.0	183.0	191.9	184.0	189.0	187.5	197.3
5.	Skilled trades	33.2	28.4	31.8	29.5	28.5	25.8	29.9
6.	Caring, leisure and other services	148.6	154.3	156.1	158.1	138.4	157.0	154.0
7.	Sales and customer service	118.1	116.3	119.7	115.0	100.1	107.6	111.1
8.	Process, plant and machine operatives	26.7	28.5	26.5	25.1	22.9	25.8	25.9
9.	Elementary	110.7	111.2	109.4	112.9	74.0	92.1	82.5
	Other/Not stated	[4.3]	*	[4.4]	*	*	*	*
Total females	1,050.0	1,066.8	1,088.0	1,082.8	1,016.3	1,048.8	1,061.0	

8) One of the problems of the modern labor market and the economy as a whole is a rapidly aging population and low fertility, and, as a result, we get an aged unprotected stratum of society that receives a monthly salary or lower. The retirement age is over 60 years in both countries [1; 3].

9) Underemployment fluctuates but remains quite high, which, on the one hand, makes labor markets more flexible, and, on the other, makes them a manipulative object because that's easier to fire the workers who don't have a full access to social security.

10) I would also like to mention such an indicator as the length of the working week. In each of the countries, the basic provision of labor legislation is observed – the 8-hour working day. However, if we take a closer look at, for example, South Korea, then overtime can provide you additional unpaid 12 working hours per week. Due to the high competition in the labor market and the vertical trend of labor migration people are simply forced to obey the schedule that the company imposes on them. That is, seeing appropriate figures, we must clearly realize that deviations from them can be quite significant. Things are better in Ireland: the average working time is 32 hours per week.

11) The last thing I would like to address is specialization and in demand jobs. Perhaps one of the main Ireland trends is the need for highly qualified personnel. The "Emerald Isle", as Ireland is often called, is the center of European and international business and technology. Ireland is actively looking for professionals in such areas as business, IT, construction and engineering. Korea demands medical and education workers, engineers, translators (multilingual skills are highly valued), etc. The most demanded field in South Korea is the educational sphere.

Thus, we can conclude that both countries have similar ways of economic development, which influenced their similarity in labor market trends much stronger than geographical or cultural factors. That also should be noted that the state of their labor markets seems more or less healthy, however, problems of the aging population, gender discrimination, market flexibility etc. are still a pressing issue.

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КОНСТИТУЦИОННОЕ ПРАВО НА ЖИЗНЬ CONSTITUTIONAL RIGHT TO LIFE

Аннотация. Право на жизнь – одно из первых прав человека, зафиксированное в ст. 3 Всеобщей декларации прав человека и в ст. 6 Международного пакта о гражданских и политических правах, и в статье 20 Конституции Российской Федерации. Актуальность темы работы обусловлена тем, что право на жизнь является важнейшим правом человека, и, исходя из этого, требует повышенной защиты и внимания со стороны государства. Основной целью статьи является обобщение и анализ содержания и практической реализации права на жизнь в Российской Федерации. В результате выполненного анализа была выявлена проблема отсутствия закрепления на законодательном уровне основного содержания права на жизнь. Изучаемые вопросы заинтересуют специалистов юридического профиля, изучающих Конституционные права человека.

Abstract. The right to life is one of the first human rights stated in article 3 of the Universal Declaration of Human Rights and in article 6 of the International Covenant on Civil and Political Rights and in article 20 of the Constitution of the Russian Federation. Topicality of the topic of work is caused by the fact that the right to life is the most important human right and, proceeding from that, requires increased protection and attention from the state. The main purpose of the research work is generalization and analysis of the content and practical realization of the right to life in the Russian Federation. As the result of the executed analysis, the problem of absence of fixing on legislative level of the main content of the right to life has been revealed. The issues under study will be of interest to legal specialists studying the Constitutional human rights.

Ключевые слова: конституция, конституционное право, государство, жизнь, право на жизнь.

Key words: constitution, constitutional law, state, life, right to life.

The right to life is one of the first human rights enshrined in international instruments, such as the International Covenant on Civil and Political Rights. This right is enshrined, in particular, in the European Convention for the Protection of Human Rights and Fundamental Freedoms, as well as in various other international legal instruments and constitutions of most countries of the world. As stated in the International Covenant on Civil and Political Rights, the right to life is an inalienable right of everyone and is protected by law. No one shall be arbitrarily deprived of life [3].

Fundamental to this concept is life. Life is a fundamental, inalienable and absolute good. The right to life in the Russian Federation was proclaimed in Article 20 of the Constitution of the Russian Federation adopted on December 12, 1993. Under Article 20 of the Constitution of the Russian Federation “Everyone shall have the right to life. Capital punishment until its abolition may be established by federal law as an exceptional measure of punishment for particularly grave crimes

against life while granting the accused the right to trial by jury". Relevance of the topic of the course work is conditioned by the fact that the right to life, as already mentioned, is the most important human right and, based on that, requires increased protection and attention from the state.

The degree of scientific development of the research. Scientific studies of the legal regulation of human life were carried out by many pre-revolutionary scientists, among whom, for example, we can single out A.F. Kistyakovsky and N.S. Tagantsev, who studied, first of all, crimes against human life, as well as the characteristics that defined life and the boundaries of life and the punishability and non-punishability of interference with human life [1].

Many jurists of the Soviet period provided a basis for a comprehensive study of the right in question. Among the famous Soviet scientists who studied the human right to life are V.E. Guliev, A.I. Denisov, N.I. Matuzov, N.S. Malein, F.M. Rudinsky and many others. The object of the study is a complex of theoretical and practical issues of constitutional consolidation and protection of the human right to life. The subject of the study is normative-legal acts enshrining the right to life, its practical application and protection.

The main objective is to study and analyze the content and practical implementation of the right to life in the Russian Federation. Based on the goals, we define the objectives:

- 1) Conceptualise the right to life and characterise it;
- 2) Consider the right to life in the system of fundamental human and civil rights;
- 3) To highlight the issue of the death penalty and restrictions on the right to life in the Russian Federation;
- 4) Consider the legal mechanisms for ensuring the right to life;

5) to study the guarantees of the right to life in the Russian Federation. The methodological basis includes the following research methods: analysis, synthesis, description [1].

Through analysis and synthesis, we will look in detail at the role of the Constitution of the Russian Federation and other legal and regulatory instruments in underpinning the provision and realization of the right to life. Through description, we will be able to look separately and in detail at the Constitution of the Russian Federation and the laws and regulations that enshrine the right to life and its practical application and protection.

The right to life is undoubtedly the first element of all other rights and freedoms. This right embodies the absolute importance of world civilization, as all other rights lose their essence and significance in the event of the death of a human being. However, despite the fact that the right to life is of paramount importance to the functioning of society, the state and the world community as a whole, there is no unified understanding of the right to life in national Russian legislation.

Part 1 of Article 20 of the Constitution of the Russian Federation enshrines that "everyone has the right to life. Part 2 of the same article states that "the death penalty, until it is abolished, may be established by federal law as an exceptional punishment for particularly grave crimes against life when the accused has the right to be tried by a jury. This enshrinement of the right to life in the Russian Constitution in fact reflects the provisions of major human rights instruments, among which we can highlight the Universal Declaration of Human Rights and Freedoms, the International Covenant on Civil and Political Rights and the European Convention for the Protection of Human Rights and Fundamental Freedoms [4].

However, this raises the question of how one should still understand the right to life, which without any explanations, transcripts and explanations is enshrined in Part 1, Article 20 of the Constitution of the Russian Federation. The right to life in our state was first enshrined in the Declaration of Human and Civil Rights that was adopted on November 22, 1991. The right to life was subsequently included in the 1978 Constitution of the RSFSR as amended by the Russian Federation Law of April 21, 1992 (Article 38) and evolved from there into the current Russian Constitution of 1993. During the period when the Constitution of the Russian Federation was in force, theoretical studies of the concept of the right to life were carried out by many scholars, but even today there are discussions regarding the scope of the content of this right.

In the legal literature, there is a widespread understanding of the right to life in a broad and narrow sense. The right to life in its broadest sense refers not simply to a person's physical existence,

but to the ability to lead a full and satisfying life that meets modern world standards. In other words, the right to life is the right to human dignity. The recognition of this right has not only moral but also legal significance. That is why its protection covers a wide range of active actions of all state and public structures and each individual person to create and maintain, first of all, safe and comfortable social and natural environment and conditions of human life. All other rights, one way or another, are united around this fundamental right.

It is the duty of the state to recognize this right and to create favourable conditions for human life by all available means. In a narrow sense, the right to life is understood, based on a logical interpretation of the relevant constitutional norm, as a natural human right to non-violent death.

The right to life in an objective sense is a constitutional and legal institution that is a set of legal norms that enshrine and regulate social relations in the realization of human life and its protection by the state. The right to life in the subjective sense is a natural, inalienable from the individual, except in cases provided for by law, and guaranteed by the norms of domestic law and international legal acts, the possibility of protecting the inviolability of life and the freedom to dispose of it [4].

Based on this, we can conclude that the content of the constitutional right to life is manifested in the protection of this fundamental right by the state, enshrined in law and ensured in fact, as well as in the possibility provided by law to dispose of this right directly by the individual and, in exceptional cases, by the state. Also, when the need arises, to apply to state bodies for its protection and restoration. It is assumed that all national legislation of the Russian Federation, all subordinate normative acts must be adopted based on the recognition of this right as the first and most important human and civil right.

Not without interest is the point of view of M. N. Maleina, who considered the right of the individual in the context of the right to preserve life (individuality) and the right to dispose of life. In addition to the traditionally emphasized elements of the essence of the right to preserve life, such as the rejection of the death penalty, regulation of the use and circulation of firearms in civil circulation, Professor M. N. Maleina includes in it the right to preserve individuality, which is due, according to Marina Nikolaevna, to the achievements of modern medicine. The problem, according to the author, concerns persons who have performed operations on correction of biological sex, transplantation of organs, etc.

The right to life is a complex, demanding, multidimensional institution, which has various contacts and interfaces with various other legal, state and social institutions. Hence the characteristic features of this institution in its formation, activity and internal structure. According to article 20 of the Constitution of the Russian Federation, the right to life is the right to physical existence.

The right to life is an institution of constitutional law. It represents the totality of legal norms by means of which the state implements its obligation to ensure, ensure the existence and development of man and citizen, respect, guarantee, protect and restore the basic human and civil rights and freedoms, which are enshrined primarily in the Constitution of the Russian Federation.

By enshrining this provision in the Constitution of the Russian Federation, the Russian Federation effectively adheres to international and general legal traditions.

This, in turn, demonstrates that our State is striving to create conditions in which the right to life is to be realized by the people and upheld by the competent State authorities, and the State is committed to developing opportunities for the realization of the right to life in the country, its protection and defence [2].

The above only highlights some of the approaches in defining the concept, essence and genesis of the right to life, and does not purport to be exhaustive of the definition under consideration.

The state, by enshrining the natural right to life in the basic law of the state, thereby assumes the obligation to

- 1) Recognizing this right by enshrining it in existing legislation;
- 2) To promote the development of comfortable conditions for the realization of the right to life, minimizing factors that may pose a threat to life;
- 3) No arbitrary attempt on a person's life and no interference with a person's life.

The right to life is generally interpreted as the right of the individual to be free from any unlawful interference with his or her life by various actors.

This is a real possibility of actual existence in such conditions, when there are no unlawful encroachments, which may entail death, or threats of such encroachments. Such encroachments, by the way, in the majority of cases form the *corpus delicti*.

Summarizing all of the above, we can conclude that:

1. “The right to life” and “life” are heterogeneous terms. The right is a social category, while life is a biological one. And it is the totality of these essences, i.e. the socio-biological essence of man that allowed him to protect his life at the legislative level by elevating the natural right to life, to physiological existence into the category of positive and enshrining it in the Constitution. Thus, the right to life is natural and inalienable from the individual, except in exceptional cases specifically regulated by law and guaranteed by the norms of national legislation, as well as international normative legal acts.

2. The lack of a unified approach in international normative legal acts and national legislation to the human right to life, as well as the absence of a precise wording allows different interpretations of the content of this right and this, as a consequence, is an obstacle to its implementation by public authorities. The right to life should be understood as an inalienable right, except in cases specifically provided by law, which a person receives from birth and which he exercises directly and satisfies the highest value emanating from human nature – life itself, as well as the values formed in the process of social development of society.

3. In order to effectively implement and ensure the right to life, it is necessary for the state to legislate its content in international legal acts. Such as, for example, the Universal Declaration of Human Rights and Freedoms, the International Covenant on Civil and Political Rights, the European Convention for the Protection of Human Rights and Fundamental Freedoms, as well as the Constitution of the Russian Federation. Containing among others, obligatorily, such elements as the right to life, the right to a dignified human existence and the right to the free disposal of life. The human right to life is the highest value because it is the foundation for all other rights and freedoms. It cannot be independently realized and secured separately from the system of other human and civil rights and freedoms that, in fact, guarantee its realization [5].

The right to life, as an element of the general system of human and civil rights and freedoms, is characterized by the presence of individual legal features, which are realized in interaction with other elements of the system.

First, the right to life stands out as the first generation of human rights, which were singled out during the bourgeois revolutions and later concretized, extended and enshrined in the legislation of democratic states.

Second, the right to life is a personal right. It emphasizes the singularity of the individual, protects him from unlawful invasion of privacy, and is natural and inalienable. The right to life, like other personal rights, is not treated as acquired but as innate and independent of the state, meaning that it belongs to every person by birth and by right of birth. They are connected to each other by one strategic, fundamental right: the right to life of every human being.

Third, the right to life is not conferred by the State, arises independently of it and without its consent, and cannot be taken away by it. The rule of law has a duty to recognize this right, to enshrine it in its constitution, and to protect it by all available means. The human right to life is the basis of all rights and freedoms in the sphere of personal security and individual privacy.

Fourth, the right to life in the system of human and civil rights and freedoms in the Russian Federation is directly applicable. This provision is enshrined in the Constitution of the Russian Federation along with the enshrinement of the supreme legal force, direct action of the Constitution and its application throughout the Russian Federation.

The right we are considering is reflected in the relationship between the individual with other people, as well as with society and the state in connection with the implementation of the vital conditions for the existence of citizens of the state. The Constitution of the Russian Federation in Article 19 establishes that all are equal before the law and the courts, the State guarantees the equality

of human and civil rights and freedoms regardless of sex, race, nationality, language, origin, property and official status, place of residence, attitude towards religion, beliefs, affiliation with public associations, as well as other circumstances.

The study of this issue has shown that the constitutional provision of the right to life in the Russian Federation is complex and multifaceted.

The right to life should not be limited to the inadmissibility of the deprivation of life and the impossibility of the death penalty for crimes. It includes the right to live a free, peaceful life and to live in dignity.

The right to life is a natural, inalienable from the individual and guaranteed by the norms of domestic law and international legal acts to protect the inviolability of life and the freedom to dispose of it. Among the variety of human rights developed and recognized by the international community, the right to life represents the highest value and is at the core of all other rights and freedoms because it forms their fundamental basis [5].

The right to life is a fundamental right of everyone, which does not depend on the political regime, the form of state structure and form of government, the international status of the country to which a person belongs. Guarantees of the right to life is a system of conditions ensuring the satisfaction of the benefits and interests of man and citizen in his life activity.

The main function of guarantees is for the state to fulfill its obligations in the sphere of the implementation of human and civil rights. The reality of the human right to life is manifested through the reality of its guarantees, and ensuring the rights and freedoms through specific guarantees is a constitutional provision.

Based on the study of constitutional and legal guarantees of the right to life, analysis of Russian legislation and practice of legal regulation of the right to life, it can be concluded that the legislation of the Russian Federation enshrines all the fundamental guarantees of the right to life. The Russian Federation, having enshrined the human and civil right to life in the Constitution of the Russian Federation, ensures its implementation and protection through the activities of State authorities and administration, courts, prosecutors and law-enforcement agencies.

The constitutional right to life of man and citizen shall be obligatory for the legislative, executive and judicial authorities, as well as for local self-government bodies to recognize, observe and protect.

An essential feature of the implementation of the human right to life in Russia is the activity of the Constitutional Court of the Russian Federation, which protects not only the specific right, but also the democratic principles and presumptions as the basis of this right [3].

In this paper, we considered the objectives that were outlined in the introduction, viz:

- 1) Conceptualise the right to life and characterise it;
- 2) Consider the right to life in the system of fundamental human and civil rights;
- 3) To highlight the issue of the death penalty and restrictions on the right to life in the Russian Federation;
- 4) Consider the legal mechanisms for ensuring the right to life;
- 5) To examine the guarantees of the right to life in the Russian Federation.

The aim of the work was also achieved – studied and analyzed the content and practical implementation of the right to life in the Russian Federation.

The study analysed all existing legislation that gives effect to the constitutional right to life.

In conclusion, it should be noted that the basic content of the right in question should be enshrined in law.

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СРАВНИТЕЛЬНЫЙ АНАЛИЗ СУБСИДИЙ НА ФИНАНСОВОЕ ОБЕСПЕЧЕНИЕ ВЫПОЛНЕНИЯ ГОСУДАРСТВЕННОГО ЗАДАНИЯ НА БАЗЕ МУЗЫКАЛЬНЫХ ШКОЛ ГОРОДА СЕВАСТОПОЛЯ

COMPARATIVE ANALYSIS OF SUBSIDIES FOR FINANCIAL SUPPORT OF THE STATE TASK ON THE BASIS OF MUSIC SCHOOLS OF THE CITY OF SEVASTOPOL

Аннотация. В данной статье на примере севастопольских музыкальных школ города рассмотрены основные задачи школ и их основные виды деятельности. Приведены нормативы затрат на финансовое обеспечение выполнения государственного задания. Подсчитан объем государственного задания за два года и объем субсидий по нормативу затрат. Проведён сравнительный анализ объема субсидии согласно нормативу затрат и доведенного объема

субсидии. А также даны рекомендации по увеличению денежных средств с помощью образовательного предпринимательства.

Abstract. In this article, using the example of the Sevastopol music schools in the city, the main tasks of schools and their main activities are considered. The standards of expenditures for financial support of the fulfillment of the state assignment are given. The volume of the state assignment for two years and the volume of subsidies according to the cost norm have been calculated. A comparative analysis of the amount of the subsidy was carried out in accordance with the standard of costs and the adjusted amount of the subsidy. And also, recommendations are given to increase funds through educational entrepreneurship.

Ключевые слова: государственное задание, субсидия, музыкальная школа, норматив затрат, анализ.

Key words: state assignment, subsidy, music school, cost standard, analysis.

In accordance with Government Decree No. 569 dated 11.12.2014 “On the establishment of cultural institutions of the city of Sevastopol”, the State budgetary educational institutions of additional education of the city of Sevastopol “Sevastopol Music School No. 1,2,3,4,5,6,7,8” were established. The institutions were created to provide educational services in the field of additional education of children on additional pre-professional and general development programs in the field of musical art, to organize the provision of additional education of artistic and aesthetic orientation of children in the territory of the federal city of Sevastopol [10].

Organizational and legal form: state budgetary institutions of the Russian Federation. Schools are legal entities.

The founder of the schools is the city of Sevastopol represented by the Department of Culture of the City of Sevastopol.

The main purpose of the schools is to identify gifted children at an early age, to create conditions for their artistic education and upbringing, to acquire knowledge, skills and abilities in the field of the chosen type of art, experience in creative activity and to prepare them for admission to educational institutions implementing professional programs in the field of arts.

The main tasks of the Schools are:

- identifying artistically gifted children and youth aged 6 to 18 years, as well as providing appropriate conditions for their education, creative development, professional self-determination;
- aesthetic education of children and youth, including the upbringing of a prepared and interested audience of listeners and spectators, by introducing them to the values of domestic and foreign artistic culture, the best examples of folk art, classical and contemporary art;
- education, upbringing and development of the child in the interests of the individual, society and state;
- realization of the moral potential of art as a means of forming and developing ethical norms, behavior and morality of both the individual and society;
- forming a common culture.

The main activities of the School are:

- the implementation of additional pre-professional programs in the field of arts;
- the implementation of general educational programs in the field of arts through individual pedagogical activities;
- the organization of methodological work of teachers, which is aimed at improving programs, content, forms and methods of teaching;
- organizing and holding concerts, competitions, festivals, olympiads of various levels of musical performance;

– preparing for the participation of students in Regional, All-Russian and International festivals, competitions.

As a rule, in government institutions the problem of budget deficit has always existed. Therefore, government agencies are forced to look for additional funds themselves according to OKVED.

Consider the standards for the cost of financial support for the fulfillment of the state assignment, the volume of the state assignment, as well as the amount of subsidies in accordance with the standard and the adjusted amount of subsidies for all music schools in the city of Sevastopol.

Table 1 shows the standard of expenditures on financial support for the fulfillment of the state assignment. According to the Decree of the Government of Sevastopol dated January 15, 2015 N 07-PP “On the procedure for the formation and financial support for the implementation of the state assignment by state institutions of the city of federal significance of Sevastopol”, the cost standards for financial support for the fulfillment of the state assignment are provided by the founder of the schools.

Table 1. The standard of expenditures for financial support for the fulfillment of the state assignment, rubles

Program		2020	2021
Pre-vocational education program	Piano	470,85	536,94
	String instruments	462,69	527,49
	Folk instruments	455,06	518,1
	Wind and percussion instruments	445,77	507,18
	Choral singing	422	475,05
	Variety Orchestra Instruments	364,58	412,03
General educational program		425,01	483,83

As can be seen from Table 1, the cost standard for each of the programs increases every year.

Table 2 shows the total volume of state assignments in music schools, according to the reporting data [6].

Table 2. Volumes of state assignments, man-hour

Program		2020	2021
Pre-vocational education program	Piano	162672,5	172673
	String instruments	42778,5	44018
	Folk instruments	101415,5	106443
	Wind and percussion instruments	40025	40582,5
	Choral singing	42525	43470,5
	Variety Orchestra Instruments	3017	4013
General educational program		178158,5	149843,5

Table 3 calculates the amount of subsidies for financial support of the government assignment in accordance with the cost standard.

Table 3. The amount of subsidy for the financial support of the government assignment in accordance with the cost standard, rubles

Program		2020	2021
Pre-vocational education program	Piano	76 594 346,63	92 715 040,62
	String instruments	19 793 184,17	23 219 054,82
	Folk instruments	46 150 137,43	55 148 118,30
	Wind and percussion instruments	17 841 944,25	20 582 632,35

	Choral singing	17 945 550,00	20 650 661,03
	Variety Orchestra Instruments	1 099 937,86	1 653 476,39
General educational program		75 719 144,09	72 498 780,61

In 2021, the amount of subsidies for financial support for the fulfillment of the state assignment for pre-professional educational programs is more than in 2020. However, there is a decrease in the amount of funds for general education programs. This is due to the transition of students from general education programs to pre-vocational programs, as well as to the dropout of students from music schools.

Table 4 shows a comparison of the amount of subsidies for the financial support of the fulfillment of the state assignment in accordance with the cost standard and the increased amount of subsidies [2; 3; 4; 5; 6; 7; 8; 9].

Table 4. Comparative table of the amount of subsidies, rubles

Year	Amount of subsidy for financial support for the fulfillment of the state assignment in accordance with the cost ratio	Adjusted amount of subsidy for financial support for the fulfillment of the state assignment	Absolute deviation
2020	255 144 244,42	223 502 558,00	31 641 686,42
2021	286 467 764,11	249 763 350,00	36 704 414,11

Thus, the required amount of subsidies in 2020 is 255,144,244.42 rubles, and in 2021, 286,467,764.11 rubles. The brought amount of subsidies in 2020 and 2021 is 223,502,558.00 and 249,763,350.00 rubles. respectively. The budget deficit in 2020 amounted to 31,641,686.42 rubles, and in 2021 – 36,704,414.11 rubles.

Thus, in order to minimize the damage from the budget deficit, it is necessary to develop educational entrepreneurship on the basis of the institution, within the framework of OKVED.

Since 2018, in addition to state educational programs, in music schools, paid educational services have been carried out, which are regulated by current legislation, order of the Main Department of 12/30/2016 No. 214 (as amended on 10/12/2017), Regulations on the procedure for the provision of additional paid educational services, a list of paid services, tariffs for paid additional educational services, approved by orders of directors of institutions.

However, these funds are insufficient to cover the budget deficit, including because these institutions lack educational space and teaching staff.

Therefore, it is recommended for schools to introduce additional types of services, for example, paid group lessons (for beginners), and tuning of musical instruments can also be attributed to paid services. It is also recommended to create contests for children and adults on a paid basis on the basis of musical institutions.

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