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THE EDUCATIONAL PROCESS AND SPIRITUAL SECURITY IN MODERN RUSSIA

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Annotation. This article discusses the issues of spiritual security, some factors in the development of modern education in Russia, their relationship with the spiritual security of Russian society. Education, being the most important institution for the translation of cultural values, norms, and ideals of society, is primarily in the plane of spiritual security. In order to overcome the spiritual and destructive tendencies of the country's development, the education system in Russia should become a strategic pivot in preserving and reproducing the culture of Russian society and the national identity of society.

Key words: spiritual safety, education, values, destructive spirituality, culture.

One of the main prerogatives of the state is a complex solution to problems in the field of culture and education. It is no secret to anyone that modern mass culture, fostering a consumer society, contributes to the development of primitive base instincts in people aimed at corrupting the body and soul. Destructive spirituality contributes to the emergence and development in society of destructive ideas, which, in turn, form destructive spiritual values. And this leads to the fact that the moral, intellectual, aesthetic spheres, being in the whirlpool of false values, infect key sectors of the development of society and civic institutions, including modern Russian education. In this regard, I would like to recall the words of Patriarch Kirill, who believes that "the root cause of the crisis is the crisis of the human person, the crisis of moral feeling, this is the crisis of loss of values ... this is" the result of the withdrawal of society from moral, spiritual values"¹. Therefore, one of the key moments of the process of ensuring spiritual security is the protection of public consciousness from the destructive effects of various negative factors. However, what is a spiritual security?

¹National Security: Scientific and State Management Content: Materials of the All-Russian Scientific Conference, December 4, 2009, Moscow: Scientific Expert, 2010. P. 340.

Spiritual safety is a criterion and indicator of the moral-psychological and moral state of not only a person, family, public institutions, but also entire states. It represents the protection of the spiritual sphere, which includes cultural, ideological, informational, scientific, educational and religious security as it species². The phenomenon of “spiritual security” is an integral part of national and constitutional security, therefore, the development and adoption of relevant laws governing the protection of citizens related to the spiritual sphere. It is spiritual and moral criteria that have become the cornerstone of social life that can create a single ideological vector of society and prevent spiritual decomposition in all areas of society.

Russian society, which is the keeper of a centuries-old creative spiritual tradition, has made a significant contribution to the treasury of world culture, science, art, today needs to protect the traditional value system. Education, being the most important institution for the translation of cultural values, norms, and ideals of society, primarily plays a special role in the field of the country's spiritual life.

Indeed, spiritual traditions and values are the core of society. The system of formed false values blocks the thinking process of citizens, destroys the spiritual foundations, plunging them into a maelstrom of degradation. It is necessary to create a unified national educational system in the country, capable of forming a single, strong, healthy society (both physically and spiritually), capable of reproducing and educating future generations in the spirit of patriotism, self-sacrifice, creative self-realization. Modern society needs a “new person” who can set the vector of development not only within the country, but also have a creative, spiritual influence on the entire world culture.

An important factor affecting the development of education in our country is the introduction of new information technologies into the educational process. Is computerization of education useful, and how does it affect students? On the one hand, living in the era of scientific and technological progress, participating in the formation and development of anthropogenic civilization, many spheres of human life cannot be imagined without technics and technology. Information technologies are used in the educational process as a means of learning in order to better assimilate information to students and its effective transmission. It is, on the one hand. But, on the other hand, a lot is not as productive as the developers of these systems suggested when they were introduced into educational institutions. Currently, we can observe the complete (crowding out) replacement of the teacher with new computer systems. I would like to note that not a single techno-

²Tonkonogov A.V. Philosophy of spiritual security of modern Russia: Monograph. M., 2013. P. 24.

logical innovation (computer, tablet, interactive boards, etc.) is capable of replacing the live presentation of material and real communication between the teacher and students. The computer and all other gadgets should be considered only as an auxiliary tool, on which a person relies when storing large amounts of information or instantly receiving the necessary material in a short time. Although even in this circumstance lies a negative: this deprives the learner of the ability for a long, humble, painstaking search; work with paper classic version of the literature. Why make physical and intellectual efforts when you can press a button and the answer will come by itself. This deprives the student of the ability to construct the correct logical sentences, leads to the formation of logically torn speech, slows down the process of socialization with other students, which is expressed in the fear of communication, expressing one's point of view, which ultimately leads to the development of various complexes. In addition, the sacred writing skill is lost when a person does not need to take a piece of paper, a pen and really create (write essays, letters, poems, draw, colorize, etc.). All this is now largely becoming the prerogative of computers, tablets and smartphones.

In fact, all pedagogy and education are reduced only to making life easier for the student. But is relief a benefit to the child? The outstanding Russian thinker F. M. Dostoevsky answers unambiguously and categorically: «It's a pity, too, that now everything is so much easier for children - not only every study, every knowledge, but even a game and toys. As soon as the child begins to babble the first words, and already immediately begin to facilitate it. All pedagogy has now gone into the care of relief. Two or three thoughts, two or three deeper impressions, survived in childhood, by one's own effort (and, if you like, by suffering), will lead the child much deeper into life than the most lightweight school, from which all the time comes out neither good nor evil, even in debauchery is not depraved, and in virtue is not virtuous»³.

Many young teachers do not stay long in educational institutions, and the point here is not at all about salaries and other material benefits, which are undoubtedly also important. The thing is that not every teacher can withstand the stress of work in the institution of the current type and communication with modern students. Their consumer attitude to everything and everyone is alarming, the lack of inner tact, good mannerliness, the manifestation of arrogance, assumption, and spoiling. Of course, we can say that "the street makes them such," however, this is not entirely true. First of all, such are their family, parents, closest associates, and society. In Russian society, many professions are unjustifiably ranked in the service sector, including the profession of teacher and pedagogue. A teacher has

³Dostoevsky, F.M. Ed. 3rd - M.: Institute of Russian Civilization, Homeland, 2016. p. 226.

become an element of the service sector, in the eyes of a certain number of members of society has turned into service personnel, who are obliged to clean up the dirt behind the student and eliminate the shortcomings of family education.

If we turn to the etymology of the word "education", we can select the root basis of the "image", which means "an ideal form of reflection of reality"⁴. Therefore, the main function of the teacher is to form the image (images) in the student's mind, using certain methods and techniques to help the child learn to think independently, isolate the necessary information from a huge Internet array, and use it deftly. Therefore, each teacher, lecturer must be, first of all, a pedagogue (the initial meaning is the person leading a child), that is, a person who leads the learner into the beautiful world of knowledge.

In order to overcome the spiritual crisis that has developed in Russia with the collapse of the Soviet Union, it is necessary to form value and moral reference points for society that will reply the current challenges of the time. Therefore, education, being the most important institution for the translation of cultural values, norms, and ideals of society, can change the prevailing destructive values and ideas in society, provide favorable conditions for creative spiritual life and healthy social and moral development. The education system in Russia should become a strategic pivot in preserving and reproducing the culture of Russian society, the national identity of society, and respond to the challenges in the socio-economic sphere and ensuring the strengthening of state-forming institutions.

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⁴Ozhegov, S.I. and Shvedova, N. Yu. Explanatory Dictionary of the Russian Language: 80,000 words and phraseological expressions. - 4th ed., M., 1999.- p. 435.

PRECEDENT NAMES AND PECULIARITIES OF THEIR FUNCTIONING IN MODERN LITERARY TEXT

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Abstract. The article addresses the main mechanisms of precedent names introduction, their functioning and usage in contemporary literary text. Special attention is paid to the mechanism of nomination in the realization of precedent names and their close connection to the phenomenon of precedent situation.

Keywords: linguistic precedence, precedent name, precedent situation, precedent phenomena nomination.

Modern multicultural world and the increasing tempo of information consumption allow for developing clip mentality in the minds of contemporary readers. Also such socio-cultural phenomena lead to blurring the text authorship, which results in neglecting the distinction between self-produced and somebody else's text. Another result of it is the possibility of adoption of certain structural elements of the text, their adaptation and later usage to achieve the communicative aim of writer or reader. In this way, discourse, which is originally characterized by the ability to present a reflection of certain political, psychological, cultural, pragmatic and other factors, turn out to be the sphere to draw the individual's attention to in order to bring out the structures of the preceding text. First of all, they are characterized by the criterion of meaningfulness, as precedent phenomenon should be «значимым как для отдельной личности в познавательном и эмоциональном отношениях и имеющим сверхличностный характер, то есть хорошо известным широкому окружению языковой личности, включая ее предшественников и современников» [1, p. 216]. The recognition of reproducibility («воспроизводимости») as one of the main characteristics of some text structures [2, p. 5] led researchers to create the basis for singling out linguistic precedence from the group of similar phenomena. Despite the fact that originally the term was widely used in legal sciences to refer to a legal case as a means to draw conclusions

from or use it as an accurate legal instrument, it gradually acquired a certain potential to be considered in the field of linguistics as a self-contained notion. One of the first scholars who helped bring the notion of precedent phenomenon out to the area of linguistics was Yu. N. Karaulov, who coined and first used the term at the VI International Congress of Russian Language and Literature Teachers (1986). Defining precedent phenomena as references («отсылки») to more or less previously known texts or text inclusions («текстовые вкрапления»), A. Ye. Suprun notes its potential usage in both written, as well as oral speech [3, p. 17]. When developing the concept of language precedence, experts denoted such characteristics of precedent phenomena as their encyclopedic character and ability to be reinterpreted. When creating a classification to suit the needs of language precedence, Yu. N. Karaulov introduces among the most basic the notion of a precedent name, which is able, in its turn, to activate the concept of denotative or significant aspect of the object described

In Andrew Miller's novel "Oxygen" one of the characters expresses his ironic attitude towards American way of life: "*Before that it was veganism, Scientology, God knows. Restless people, the Americans. Everyone wanting to be **Peter Pan** or **Tinkerbell***". In this case, apart from appealing to the literary characters of Peter Pan and Tinkerbell created by the Scottish playwright J. M. Barry, which is done for the purpose of nomination, there is a consecutive actualization of traits of both characters most widely recognized by English-speaking community. According to the article definition from Encyclopedia Britannica, after the release of the theatrical play under the same name in 1928 and a cartoon by Disney Company in 1953, Peter Pan grew to be associated in the mind of a native English speaker with the wish to remain a child forever ("being an eternal child") [4]. The well-recognized image of pixie Tinkerbell, later being used as a part of Disney logo, possesses similar characteristics of childish naughtiness and jealousy. Used together in one associative range, the precedent names point at the stereotypical image of Americans being the nation of men and women of immaturity and infantilism.

The statement about the structurally heterogeneous character of a precedent name emphasizes the associative character of precedent name – object of reference connection. Despite the tendency to identify the precedent name with a single, most commonly associated trait of character, its structural core is not represented as a single-component, but rather as a complicated phenomenon that includes both distinctive features (usually describing appearance or traits of character) and its attributes, which are closely connected with the core but are not necessarily required for identi-

fication. [5, p. 89]. For instance, perhaps one the most universally acknowledged precedent names to describe betrayal is Judas, notoriously known for centuries for his actions against Jesus Christ, his name being closely connected with the precedent situation [5, p. 93]. In Andrew Miller's novel "Oxygen" one of the characters mentions the following resemblance of her father in his youth: «*She had a memory of him – though in fact it was the memory of a photograph – sitting astride the motorbike on the drive, leather jacket, old parachute boots, goggles that made him look like the **Baron von Richthofen***». Despite the obvious figurative character of precedent name representation, its establishment as one bearing precedent character is manifested through the reference of what ace pilots of World War I period looked like, wearing special military uniforms typical for that time (leather jacket, old parachute boots, goggles). In its turn, it linguistically requires appealing to attributes of the precedent name (a professional uniform look) and almost totally ignores other immediate core characteristics, such as traits of an individual's character.

One of other aspects of precedent name functioning is polysemy of some of them, which is understood here as a term describing possession of not only one, but a group of distinctive features having the same significant potential to represent the name's characteristics and hint at the precedent situation. The following passage is used to illustrate this point: "*A pale half-moon hung in the blue of the twilight, and in some quarter of the sky the **comet Hale-Bop**, that vast event of ice and dust, was making its passage back towards the celestial equator. In the early spring he had often watched it from among the TV aerials on the roof of his flat, and had found it hard to believe that its great ellipse would not provoke **some happening** in the world, or many happenings – countless individual fates falling in an astral rain from the comet's wake – but for the moment at least the sky was unexceptional, the usual faultless machine with nothing extraordinary or dangerous happening in it*" (A. Miller, "Oxygen"). The character has been watching the Hale-Bopp comet appear in the sky, and this name seems to be precedential, being recognized by the English-speaking community mass-media as one of the most watched comets of all history [4]. Moreover, it has been noted to cause numerous rumors about potential alien invasion and even forced many "Heaven Gate" religious cult adepts to commit suicides in 1997, as a result gaining notorious reputation. Its tragic character is hinted at within the next lines, being described by the novel character as a potential "happening", which is reflected through the metaphoric hint ("*countless individual fates falling in an astral rain*").

One of the ways to implement a precedent name into the context is to mention it as part of a precedent situation, which represents the strong bond of association between the precedent name given and the situational usage of one of its attributes. Describing his childhood memories, László Lázár, a Hungarian immigrant, mentions “*his grandparents’ stories of Admiral Horthy on his white horse*” (A. Miller “Oxygen”). The precedent name of admiral Horthy, the regent of Hungary in 1920–1944, acquires symbolic character and is reflected in the mind of the language users as associative part of a precedent situation of 1938, when parading on a white horse to celebrate the returning parts of southern Slovakia to Hungary, the admiral was greeted by the crowds of people with overwhelming enthusiasm [6].

There are cases when the nomination is performed through assigning the individual to a certain range of distinctive characteristics, typical for some other individual. Pondering over the member of her family to address for help, the terminally ill character of A. Miller presents one of her relatives as follows: «...*perhaps it would be wiser to speak directly to Brando. He was **the power and the glory**, the last word in it all. And he had promised to look in before the end of the week*». The main source of precedent reference in this case is the title of Graham Green’s novel “The Power and the Glory”, describing the hard period of time when Catholic church was outlawed in Mexico in the 1920s [4]. Nevertheless, the decisive choice in the naming process is being made not upon the title of the novel, but because of precedent characteristics of the protagonist of the novel, a priest who tries to fulfill his duties despite the constant threat of death at the hands of a revolutionary government.

Despite the mode of precedence name representation which presupposes the nomination of a person or an object being based on his attributes, there are instances when the immediate nomination is hampered due to considerable number of precedent names bearing similar characteristics. “*He smiled companionably at the mother, who did not smile back but said, ‘She’s nauseous,’ in such a strong New York Jewish accent Larry thought at first it must be the child’s name, and was trying to puzzle out which **feisty Old Testament heroine** she was named after, when the woman snatched the air sickness bag from its slot behind the in-flight magazines*” (A. Miller “Oxygen”). The potential prerequisite for non-establishing one particular precedent name in this case is the fact that the character’s conscious operates the established image of Old Testament heroines based on the range of generalized characteristics, due to which character’s precedent naming can be hampered.

Summing up the aforesaid, there are several deductions on the precedent names and the peculiar features of their realization to be made. When the usage of one single precedent name for the purpose of bringing out its essential characteristics is quite typical for different types of texts, sometimes the usage of a chain of precedent names is observed. This is usually done in order to enhance the overall emotional effect of expressiveness, especially when they have the same cultural source of reference and similar distinctive features. Apart from bringing out the core distinctive features, there is a tendency to appeal to some attributes of a precedent name, which are vital for its accurate interpretation. Also there is a trend towards singling out precedent names as markers to evolve into the wider context with the help of attributes, or to immediately include a precedent name into a precedent situation for the sake of its better recognition.

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DIALOG AS A COMPONENT OF LITERARY TEXT (ON THE EXAMPLE OF FRENCH FICTION)

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Abstract. *The article discusses the main characteristics of dialogue as a component of a literary text. It is noted that the implementation of the personality factor in communication forms the modality of the dialogical fragment. The structural and functional analysis of episodes of the A. Truay Trilogy “Les Eygletière” (“The Egletier Family”) is presented, which characterizes the features of the speech actions of the characters. The role of dialogue in the development of events and characters is emphasized: the result of the interaction of communicants is predetermined by presuppositional conditions and changes in the subject environment.*

Keywords: *literary text, dialogicity, dialogical fragment, polyphony, pragmatics.*

Literary text as an object of study is a complex and multi-layered phenomenon. The purpose of its creation is the transfer of intellectual, emotional, cultural, aesthetic information.

A literary text is a text based on a figurative reflection of the world and acting as an object of interpretation. A novel is an artistically organized “social discord”, or “multilingualism” [3].

The most important component of the structure of a literary text, which forms its polyphonic character and acts as the basic form of verbal communication, is dialogue. The theory of dialogueism, the essence of which is the equal coexistence of “I” and “the other” in a large dialogue, was formulated by M. M. Bakhtin [2]. The interconnection and interaction of various social voices form linguistic pluralism in the real communication of people, demonstrating the complex and inevitable interaction of statements [1].

A dialogue in the broad sense means a meeting of two consciousnesses, any text is always “two-planes” and “two-subject”, and from this point of view, non-dialogical speech does not exist. Dialogism is a universal phenomenon that permeates human speech as a whole, it is a global property that is inherent in any text from the very beginning.

Artistic dialogue, being a form of secondary communication, is a means of realizing an aesthetic and cultural function due to the author’s personality [4].

Literary communication, like any interpersonal communication, is always a dialogue. The interaction of the “I” and the “other” at different textual levels is represented by different subjects of speech: at the external textual level as an author and reader, at the intertextual (narrative) level as a narrator and character, on the intertextual level as two authors, one of which is a reader of the other, that is, it uses a component of the content structure of someone else’s text (intertext) to create its own.

The special significance of text fragments is explained by the fact that they represent the character in communication, in interaction with “others”, which means that two areas are combined: character and non-character (author). The textual nature of the artistic dialogue is manifested in a particular organization of both content and form. Character and author’s speech presents the reader with speech and accompanying dialogue non-speech reality, therefore, in the practice of analyzing a literary text, the term “dialogical fragment” is used [5].

Dialogues in a literary text are of two types: open and closed.

Dialogues of the open type do not carry overtones, the characters explicitly express their position. In a closed-type dialogue, the subtext is the main one, gestures help the reader to determine the true motives of the characters hidden in the conversation from the interlocutor.

The speech of the characters directly in the literary text should not be analyzed as a basis for the study of natural colloquial speech. It is possible to relate these types of dialogue by language means only partially, since the complete set of dialogical texts has not been compiled and studied.

The dialogue between the narrator and the literary character is a narrative communication. The result of the interaction of the author and someone else’s speech is the internal dialogization of the literary text.

The essence of the dialogue between the narrator and the literary character is in the interaction of different voices, primarily the discourse of the narrator, who is the representative of the author in the literary text and, accordingly, the discourses of the characters. Dialogue can contribute to the development of the plot, create and reveal the secrets and complexities of the relations of heroes.

Dialogical structures contain various options for motivation, relationships, interactions of replica stimuli and replica reactions. Stimulation of replications as a psycholinguistic phenomenon reflects the purposefulness of the dialogue: in this case, the initiating replica determines the following type of communication: a clash of views, clarification of one's position, an attempt to clarify the response, the desire to obtain a positive solution from the interlocutor, etc.

Replies-reactions can have the value of consent, objection, putting forward their arguments, as they can express opposite feelings about one object. The operational orientation of the addresser and the addressee - communication characters - is determined by the personal views, values and properties of the speaker, but the author's dialogue strategy directs the modality of the replicas and the analyzed interpretation background.

Structural and functional analysis of the features of speech actions in the dialogs of the characters of the A. Truay trilogy "Les Eygletière" ("The Egletier Family") shows that the basis of the pragmatic aspect is the communication goals of communicants [6]. It is in the dialogue that the development of events and characters is manifested. A vivid example is the following episode - the meeting of father and son after the return of Jean-Marc from a trip to America. The role of the initiator, and accordingly the initiating remark belongs to Philip. The intentions of Jean-Marc and Philip are directly opposite: the first wants to share his impressions that are bursting with him; the second is not located to perceive them adequately. There is a conflict of interests: the old generation does not want to either recognize, much less admire something unknown, foreign, which captivates young people.

Philip, with all his desire, cannot ignore an important information occasion - Jean-Marc's trip to New York.:

– *Salut, mon vieux! Bon voyage?*

– *Hello old man! How's the trip?* [6, p.9].

And further:

– *Alors, raconte! dit Philippe. Comment as-tu trouvé l'Amérique?*

– *Well, tell me! – Philip said. – What are your impressions of America??*

[6, p.9].

The communicative intentions of father and son do not coincide: Jean-Marc seeks to share his impressions of a trip to the United States. Philip is trying to "set down" Jean-Marc and does not want to share with him his enthusiastic impressions. There is a fact of communicative failure: not one of the communicants can achieve the goal.

The interlocutors are in an apartment owned by Philip, which determines his dominant position. Jean-Marc is forced to restrain himself, if only out of a sense of courtesy.

Social roles are determined by previous relationships in accordance with the status of father and son. Jean-Marc is too delicate to openly conflict with his father, especially on such a minor occasion.

The dialogue flows into a discussion of minor issues:

– *Carole n'est pas avec toi?*

– *Carole? Non! dit Jean-Marc. Pourquoi?*

– *Isn't Karol it with you?*

– *Karol? No! –Jean-Marc Answered. What's the matter? [6, p.8].*

The usual question knocks the son out of balance: the essence of the connotative meaning lies in the manifested emotional feelings for the step-mother. Hence the feeling of shame and hostility at the mention of Karol's father. This aspect has been clarified in the use of the author's narrative:

«*Une ombre traversa l'esprit de Jean-Marc*»

«*A shadow flashed in Jean-Marc's mind*» [6, p.8]

The direction of the dialogue lies in the active role of the father. The implementation of the intentions of Philip leads to a decrease in the level of communication to common, mundane.

An analysis of another example of the structural and functional features of a small dialogue concerns the communication process between Jean-Marc and Carol.

– *Les femmes, dit Carole, que penses-tu des femmes américaines?*

– *Elles sont comme les femmes françaises, dit-il. Il y'en a de moches, il y'en a de bien.*

– *What about women? - Karol asked, - what do you think of American women?*

– *They are the same as the French women. There are ugly ones, and there are normal ones. [6, p.12]*

Despite the fact that the initiative remark is framed in the form of a question, it does not apply to information discourse. Jean-Marc correctly understands the subtext. This aspect has been clarified in improper direct speech:

«*Cette question, venant d'elle, le gêna. Il n'avait eu aucune aventure sentimentale importante à New York*».

«*This question she asked confused him. He didn't have a single significant sentimental adventure in New York*».

The line exchange in this polylogue suggests the active role of Karol and Philip. The initiative replica belongs to Karol. Jean-Marc, as usual, only voices the response line (reaction).

Philip and Karol were on a cruise in Greece, involving an exchange of experiences. Instead of exchanging opinions, we got a completely uninteresting conversation with Jean-Marc that bothers him.

Carole took the opportunity to regain Jean-Marc's affection. This is revealed in the course of thoughts of Jean-Marc in solitude, in the room allotted to him. His inner speech makes up for speech actions that he could not afford due to his delicacy:

«Ce n'était pas par hasard qu'elle les avait placée là, mais sans doute, pour ranimer en lui le sentiment dont il eût voulu effacer jusqu'au souvenir».

«It is no coincidence that they put them here (we are talking about red roses). There is no doubt that she wanted to revive in him that feeling, the very memory of which he wanted to erase».

The communication goals for each of the three communicants are different, which ultimately leads to a communicative failure: Karol aims to keep his stepson in his sphere of influence; she does not succeed.

Philip seeks to demonstrate solidarity with his wife, but he looks somewhat deliberate and comical.

Jean-Marc is in frustrated feelings, can not find the ground under his feet.

The action takes place in the apartment of Philip and Karol. The subject components of the situation determine the communicative failure:

«Soudain, il eut l'impression d'étouffer entre ces quatre murs».

«Suddenly he felt suffocating within four walls». [6, p.13]

In this case, the narrative clarifies the situation of communication.

An analysis of the socio-psychological components of the situation reveals the strained relationship between the communicants: in the end, Jean-Marc seeks to leave his father's apartment as soon as possible. At first glance, a fairly innocent exchange of lines contains "pitfalls."

The hidden emotional pressure Karol expressed in the sentence: – *Tu couches à la maison, décréta Carole.*

– *You stay overnight in the house, -Karol ordered.* [6, p.12]

Using this form of invitation reveals a veiled intention to command not only of the stepson's whereabouts, but also his moral condition in connection with his stepmother, to whom he had inappropriate feelings.

The contradictory nature of this communication is felt by Jean-Marc himself.:

«Il accepta, mi-contrarié, mi-satisfait, cette solution confortable».

«He agreed to this convenient decision, half annoyed, half satisfied».
[6, p.12]

The given examples - dialogs demonstrated rather complicated, contradictory relations between the interlocutors. These relationships result in difficult conditions, goals, modality of speech acts. The pragmatism of dialogues, which consists in the achievement of certain goals by communication participants, is determined by many aspects. The full characterization of the characters is presented by the author using various means of influencing the reader: in communication with his father and his second wife, Jean-Marc cannot communicate successfully due to a number of presuppositional conditions: complex relationships with both Philip and Carole, dichotomy in awareness his dishonesty in relation to of his father in connection with feelings for Karol.

The image of Jean-Marc combines different personality traits: on the one hand, he is a very delicate, gentle, intelligent young man who evokes sympathy; on the other hand, overwhelmed by conflicting feelings and often acting against his desires.

These basic characteristics of a socio-psychological nature are enhanced by the action of the traditional generational conflict, repeatedly outlined in world literature. As part of the study of the pragmatics of dialogue, such a conflict leads to a mismatch of the component composition of the model of the communication situation, as well as the functional-semantic structure of the communicative situation.

All these aspects lead to a communicative failure. A specific situation threatens to develop into an open conflict. In the framework of the dialogues we have analyzed, we have identified a connotative aspect that takes into account all other prerequisites.

Thus, the conditions of presupposition determine the vector of development of communication. The socio-psychological characteristics of the characters, manifested in a dialogical fragment, are predetermined by the entire course of the narrative.

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PEDAGOGICAL EXPERIMENT FOR FORMING PROFESSIONAL MOBILITY OF FUTURE BACHELORS IN ADAPTIVE PHYSICAL EDUCATION

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Resume. This article is devoted to the problem of the formation of professional mobility of future bachelors in adaptive physical education. The purpose of this work is to describe the progress and results of a pedagogical experiment on the formation of professional mobility among students. Materials and methods. The article scientifically substantiates the pedagogical conditions implemented in the experimental work. The basis of the experimental work was the method of pedagogical experiment: ascertaining and forming experiments. The experiment was attended by 33 students. Results. In the course of the formative experiment, a program for the formation of professional mobility of future bachelors in adaptive physical education was implemented. The article describes the motivational-targeted, cognitive-operational and reflective-diagnostic stages of the implementation of this program. During the implementation of the program, psychological, pedagogical, scientific-methodical and social support was provided for the process of forming professional mobility of students. In conclusion, the author summarizes the pedagogical conditions that ensure the positive dynamics of the formation of professional mobility of the future bachelor in adaptive physical education.

Keywords: higher education, future bachelors in adaptive physical education, professional mobility, support technology, pedagogical conditions, pedagogical experiment.

Introduction

Professional mobility determines the tendency of continuous self-development and self-education of a professional's personality, determines his ability to act effectively in new conditions, is a key component of professional competence.

Despite the universal nature of professional mobility, its content and development opportunities are determined by a specific professional sphere. In particular, professional activities in the field of adaptive physical education require a high degree of horizontal mobility. This is due, firstly, to its integrated character (synthesis of pedagogical, educational, developmental, rehabilitation, compensatory, preventive activities), and secondly, the need for continuous improvement of professional competence and a set of personal qualities. In the vertical dimension, this professional sphere is quite limited, not associated with wide social recognition, the authority of a professional in the field of adaptive physical education is local. In this context, the development of professional mobility allows the bachelor in adaptive physical education to self-actualize his personal potential, satisfy the need for success and recognition. This increases the productivity of labor, prevents professional burnout.

Materials and methods

The analysis of the scientific and methodological literature on the problem of the formation of professional mobility of the future bachelor in adaptive physical education made it possible to scientifically substantiate the pedagogical conditions that determine the effectiveness of this process, which were implemented in the course of the experimental work.

As part of the implementation of the first pedagogical condition, based on an analysis of the works of S. G. Vershlovsky [1], O. S. Gazman [2], E. I. Kazakova [3], I. A. Lipsky [4], L. V. Mardakhaev [5], Y. V. Slyusarev [6], a process support technology was developed the formation of professional bachelor mobility in adaptive physical education. It is based on the unity of psychological, pedagogical, scientific-methodical and social support of those types of students' activities that allow us to form the qualities, personality characteristics and competencies that underlie professional mobility. This technology is a sequence of actions of the teacher and students, which correlates with the stages: motivational-targeted, cognitive-operational and reflective-diagnostic.

In the framework of the second pedagogical condition, a program was developed to accompany the process of forming professional mobility of a bachelor in adaptive physical education, which includes a goal, tasks, stages, content, forms, methods.

The third pedagogical condition involves the inclusion in the process of forming professional mobility of future bachelors in adaptive physical education of active and interactive methods and forms of education and training.

Within the framework of the fourth pedagogical condition, the key methods of support technology were identified: an individual professional self-development card and student portfolio.

Pilot work was carried out on the basis of the Institute of Physical Culture, Sports and Life Safety of Bunin Yelets State University . Chronological framework of the experimental work: the second half of 2015 - the first half of 2018. The basis of the experimental work was the method of pedagogical experiment. To conduct a pedagogical experiment, the control and experimental groups were determined. The control group consisted of 17 students, the experimental group consisted of 16 students. During the pedagogical experiment, students studied at 3-4 courses.

Results

According to the results of the input diagnostics, it was possible to establish that the majority of students at the beginning of the experiment have a potentially non-mobile level of professional mobility (47% of students in the control group and 50% of students in the experimental group), about a third of the students demonstrate a conditionally mobile level (41% of students in the control group and 38% students of the experimental group) and only 12% of students in both groups show a potentially mobile level. The use of the chi-square mathematical statistics method for comparing two experimental distributions made it possible to confirm the equality of the starting conditions of both groups.

At the formative stage of the experiment, the organization of the educational process in the control group was carried out in the traditional way, and a program for supporting the process of shaping the professional mobility of the future bachelor in adaptive physical education was introduced into the educational process of the experimental group. The program was carried out in three stages: motivational-targeted, cognitive-operational and reflective-diagnostic.

The motivation and target stage was focused on the development of professional motivation of students, the formation of individual and group goals of their professional development. At this stage, psychological support for this process was carried out, diagnostics were carried out.

The introductory event is a seminar-research "Portrait of a bachelor in adaptive physical education". This work was continued in the form of a series of trainings "How to develop professional motivation in yourself?", "How to achieve success in professional activity?", "Learning professional reflection". The main goal of the trainings is to jointly learn how to solve problems. In the 7th semester, a foresight session "Modeling our professional future" was held, during which a time map of the profession on adap-

tive physical education was developed. Also, psychological support was provided during the students' internships in the form of group and individual consultations.

The pedagogical support of the formation of professional mobility of students was carried out through the technologies of an individual card of professional self-development. Work with an individual card of professional self-development was carried out in the form of an independent student activity. The mentor periodically provided advisory assistance. In the 5th semester, a seminar-research "Strategies for self-education and career planning" was conducted. At the seminar, such issues as self-diagnosis and assessment of the level of development of professionally important qualities were voiced; determination of individual occupational deficits; planning strategies and actions to overcome identified difficulties.

The cognitive-operational stage involves the implementation in the educational process of pedagogical, scientific-methodical and social support.

The pedagogical support of the process of forming professional mobility of students was implemented in the form of separate events held on curatorial hours. In the 5th semester, the seminar-research was introductory in nature and was devoted to the study of the system of professions and positions in the field of adaptive physical education. The organization of the seminar-research was based on the principles of problematic teaching technology, and such technological methods as the creation of mental maps and chronologies were actively used. In the 6th semester, the theme of the seminar-research was the following: "What you need to know in order to ensure career growth". From a technological point of view, the seminar was also organized in line with the problematic training. During the seminar, such technological methods as building models, creating chronologies were used. The main purpose of these seminars was to inform students about the specifics of positions and the established mechanisms of professional growth. In the 8th semester, a seminar-research "How to search and find work?" Was held. Within the framework of this seminar, methods of employment were considered, and also, as part of the implementation of short-term projects by students, an overview of the main Internet job sites was made.

Scientific-methodical support of the process of formation of professional mobility of a bachelor in adaptive physical education allowed the development of the strengths of professional competence of students in the organization of research activities. An important component of scientific-methodical support was teaching students the basics of writing a scientific article and preparing a scientific report. This type of activity was carried out

in the format of workshops that were held on curatorial hours ("Learning to write a scientific article", "Learning to speak at a conference"). As a result, these skills were reinforced by students in the 6th and 8th semesters in the form of participation in the annual scientific and practical conference of students, in addition, many students took part in various conferences on their own.

Social support for the process of forming professional mobility of students was carried out according to the principles of immersion in the problem, from imitation to practice. The problem of awareness and acceptance of the features of professional interaction with colleagues and students in the professional field of adaptive physical education was solved within 5-6 semesters. The problem of effective behavior during professional conflicts was solved was considered in the 7th semester. Correction and consolidation of social competencies of students in the field of professional conflict resolution were made during the period of teaching practice in correctional educational institutions. The problem of communication with management and the employer was solved in the 8th semester in the form of 2 seminars-games "Professional communication with management", "Interaction with a potential employer."

The reflexive-diagnostic stage is aimed at the formation of the student's reflective position regarding the development of a professional self-concept, diagnostics and self-diagnosis of changes in its development. At this stage, students were diagnosed and self-diagnosed. Also, psychological support was provided to students.

In the analysis of the results of the final diagnosis, it was possible to establish that the dynamics of the levels of formation of professional mobility of students in the control group is insignificant: an increase in the proportion of students demonstrating a potentially mobile level by 6%; maintaining the proportion of students demonstrating a conditionally mobile level, with a corresponding decrease in the proportion of students demonstrating a potentially non-mobile level by 6%. The dynamics of the levels of professional mobility of students in the experimental group are significant: an increase in the percentage of students demonstrating a potentially mobile level by 32%; an increase in the percentage of students demonstrating a conditionally mobile level by 12%, with a corresponding decrease in the percentage of students demonstrating a potentially non-mobile level by 44%. For statistical confirmation of the experimental results, the chi-square method was used. The revealed differences between the dynamics of the development of professional mobility in the control and experimental groups are statistically significant at more than 0.1% level.

Conclusion

The positive dynamics of the formation of professional mobility of the future bachelor in adaptive physical education is due to the creation of the following pedagogical conditions: the development of technology to support the process of formation of professional mobility of future bachelors in adaptive physical education; development of a program to accompany the process of forming professional mobility of future bachelors in adaptive physical education; inclusion in the process of forming professional mobility of future bachelors in adaptive physical education of active and interactive forms and methods of training and education; ensuring continuous diagnosis and self-diagnosis of the development of professional mobility of students.

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PARTICIPATION OF AZERBAIJAN IN THE INTERNATIONAL COOPERATION OF STATES IN THE CULTURAL SPHERE

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Annotation. Since 1993, in Azerbaijan the international cultural policy is actively carried to international life. Develops a cultural contact, both within of bilateral relations, and within of the International organizations, especially within in framework of UNESCO. In the international cultural cooperation there are qualitative changes. Azerbaijan participates in the international cultural projects. Intergovernmental agreements on cultural cooperation have been entered into. The special role in development of cultural cooperation within the framework of UNESCO belongs G.Aliyev's Fund.

Keywords: Constitution of the Republic of Azerbaijan, UNESCO, international cultural policy, foreign policy

The Constitution of the Republic of Azerbaijan states that in international relations the country seeks to develop comprehensive friendly relations with the international community in all spheres, including in the cultural sphere. Since 1993, with the advent of the national leader H. Aliyev to power, the country has actively pursued a cultural policy, improved the mechanism of state power in the cultural sphere. The foreign policy mechanism is aimed at developing cultural ties, both within the framework of bilateral relations, and within the framework of international organizations, especially within the framework of UNESCO.

In 1993-2010, qualitative changes took place in international cultural cooperation [1]. The main trend of this period in this area is that Azerbaijan, developing bilateral cultural ties, is moving to the level of international cultural cooperation within the framework of international organizations. If in the 1990s. the main elements were individual cultural events and tours of music and theater groups, then in the 2000s. Azerbaijan organizes and participates in international cultural projects [6].

The main forms of Azerbaijan's participation in international cultural cooperation for the period 1996-2000s. were: participation in festivals - 66 (26.09%), participation in international meetings and meetings - 43 (17.00%), working visits - 33 (13.04%), participation in anniversaries - 27 (10.67%) and tours - 25 (9.88%) [6].

During this period, Azerbaijan pays great attention to the restoration and) the development of cultural cooperation in the framework of bilateral relations. In recent years, intergovernmental agreements on cultural cooperation have been concluded with Russia, China, England, Poland, Turkey, Romania, Uzbekistan, Georgia, Greece, Bulgaria, Moldova, Kazakhstan and Italy. Also, interdepartmental agreements (between ministries) were signed on cultural cooperation with Russia, Bashkiria, Belarus, China, Iran, Georgia, Ukraine, Turkey, Kyrgyzstan, etc. [2, p. 69-71].

The cultural cooperation program between the Russian Federation and the Republic of Azerbaijan for 2006-2010 is being successfully implemented [3, p. 61]. The Days of Azerbaijani Culture in Moscow and St. Petersburg, as well as the Days of Russian Culture in Azerbaijan became regular. With great success were held in the summer of 2000, Moscow Culture Days in Azerbaijan, the exhibition of the State Museum of S.A. Yesenin, a significant event was the opening in 2001 in Baku of the monument to A.S. Pushkin, whose work is very popular in Azerbaijan. In April 2002, the Days of Russian Culture were held in Baku [4, p.2]

It is very pleasant that Vladimir Putin, during his memorable visit to Azerbaijan in 2001, expressed satisfaction with the availability of all the conditions and opportunities for Russians living in Azerbaijan as full citizens of the country to be able to receive education in their native language at all levels, to develop their culture [4, p. 219].

Established bilateral relations in the spiritual sphere are already yielding positive results. A vivid example of this is the activity of such an international magazine as "Irs-Heritage", the main leitmotif of which is Azerbaijani-Russian relations, their history, development, and current state.

A new and highly productive form of international activity is multilateral cooperation. Despite the short period of its existence as an independent state, Azerbaijan was able to establish and establish contacts in the cultural sphere with international organizations such as UNESCO, the Council of Europe, ISESCO, TURKSOY, the Council for Cultural Cooperation of the CIS, GUAM, etc. [1]

Azerbaijan became a member of UNESCO in 1992. During this period, significant international actions were carried out jointly with UNESCO, such as the 500th anniversary of the great Azerbaijani poet Fizuli,

the celebration of the 80th anniversary of the outstanding composer Kara Karayev, and the 1300th anniversary of the epic Dede-Korkud. All these events were held at the headquarters of UNESCO. Azerbaijan's relations with the World Heritage Center, the Department of Cultural Heritage and the Department of Intercultural Dialogue of UNESCO have intensified, as a result of which Azerbaijani specialists regularly participate in international conferences, seminars, symposia held abroad, and are also the host for UNESCO events of various sizes [7].

A special role in the development of cultural cooperation within UNESCO belongs to the G. Aliyev Foundation, which is headed by the Goodwill Ambassador, the first of Azerbaijan Mehriban Aliyeva. Namely, largely thanks to her initiatives in the 2000s, many cultural events were held, cultural projects of an international scale were carried out [7].

Cultural relations with the Council of Europe occupy one of the key positions in the total volume of international relations. Despite the fact that Azerbaijan became a member of this organization only in January 2001, the Ministry of Culture of Azerbaijan began active cooperation with the Committee on Culture of the Council of Europe back in 1999, shortly after the country signed the European Convention on Culture (in 1997). In 2000, the Ministry of Culture of Azerbaijan took part in the project "Cultural Policy in Europe: a compendium of basic facts and trends". Since 2001, Azerbaijan has been a member of the STAGE regional project, which was initiated by the Council of Europe's Department of Cultural Policy. The main goal of the project, designed for 3 years, is to support a new cultural policy in the countries of the South Caucasus. One of the important stages of this project is the writing of the National Report on Cultural Policy, carried out by local experts together with their European colleagues. The project includes national debates on cultural policy issues, training, etc. Azerbaijan also attaches great importance to participation in the project "Culture and Conflict Prevention" within the framework of the Council of Europe [2, p. 85].

The TURKSOY organization carries out regional cooperation of Turkic-speaking countries in the field of culture and art, regardless of domestic and foreign policy, political orientation of their state structures. The International Organization for the Joint Development of Turkic Culture and Art (TURKSOY) was established in 1992 on the basis of agreements reached during meetings of the Ministers of Culture of the Republic of Azerbaijan, the Republic of Kazakhstan, the Kyrgyz Republic, Turkmenistan, the Republic of Turkey and the Republic of Uzbekistan in Istanbul and Baku. The "Agreement on the establishment and principles of TURKSOY's activity" was signed by these countries on July 12, 1993 in the city of Almaty (Kazakhstan) [2, p. 94].

The activities of the International Organization for the Joint Development of Turkic Culture and Art (TURKSOY) cover the following directions:

- development and strengthening of ties between Turkic-speaking countries in the field of culture and art;
- joint implementation of various programs and projects for these purposes;
- implementation of measures aimed at identifying, preserving, re-searching,
- development and promotion of common spiritual values, historical heritage, works of culture and art, traditional sports and folk 'games of Turkic-speaking countries;
- organization of festivals and competitions in the field of theater, music, opera and ballet;
- organization of exhibitions, vernissages and other events aimed at the development of the visual and plastic art of Turkic-speaking countries;
- establishment of mutual relations with other international and national organizations, public structures and movements in the field of culture, art, education, etc. [6]

Within the framework of TURKSOY, many events were carried out that made a significant contribution to the development of the culture of Turkic-speaking states. Azerbaijani President I. Aliyev and Milli Majlis pay special attention to the development of this organization, on the basis of which the process of structuralization of political and economic relations of Turkic-speaking states can develop in the future [1].

On June 8, 1996, in the city of Istanbul (Turkey), an "Agreement of mutual cooperation between TURKSOY and UNESCO" was signed, which provides for the coordination of their activities in the field of culture, the art of education and science, aimed at preserving and enriching the historical and cultural heritage of Turkic-speaking countries and peoples, increase of intellectual and spiritual wealth, protection of human rights and freedoms.

In July 2002, the Ministers of Culture of the GUUAM member countries, which includes Georgia, Ukraine, Uzbekistan, Azerbaijan and Moldova, signed the Agreement on Cultural Cooperation within the framework of GUUAM. In the future, Uzbekistan leaves the Organization, but continues to cooperate in the cultural sphere [2, p. 118].

Azerbaijan also pays special attention to the development and strengthening of normative activities in the field of international cultural cooperation. So, in the 1990s, Azerbaijan joined a number of international conventions of great importance for the development of international cultural

cooperation, international cultural exchange between peoples, the implementation of which is possible only if modern norms of international law are observed. Azerbaijan joined the conventions on culture:

- International Covenant on Economic, Social and Cultural Rights (1992),
- UNESCO Convention and Protocol for the Protection of Cultural Property during Armed Conflict (1993),
- The UNESCO Convention for the Protection of the World Cultural and Natural Heritage (1993),
- The European Convention on Culture (1997), the Convention on Measures to Prohibit and Prevent the Illicit Import, Export and Transfer of Ownership of Cultural Property (1997),
- European Convention for the Protection of the Archaeological Heritage (1999), European Convention on the Joint Filmmaking (1999) [6]

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WOMAN IN THE ART. THE ARTIST. MAECENAS. MODEL

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Abstract. At all times, the image of a woman inspired the creators. Mothers, beloveds, daughters, strangers — they all became heroines of paintings from ancient times, when his wife and priestesses were depicted next to Pharaoh, and along with the heroes on Greek amphoras, beautiful dancers. Then, in ancient Greece and Rome, the image of Venus (or Aphrodite) was born as a symbol of female beauty, which in each era found a new incarnation. Especially attractive was the image of a woman created by the masters of the Renaissance.

Now women's images appear on the canvases of our contemporaries, no less. All of them depict different heroines with their own stories and characters. Depending on the mood of the picture, both material and color are chosen. Every woman is unique and multifaceted; therefore, from century to century, artists cannot resist her beauty and try to catch a fleeting glance, a slight movement, reveal hidden character traits and portray a true, beautiful image in their picture.

This article aims to consider the image of women in art and culture. Special attention is paid to the inner world of a woman, her appearance, to human qualities, to how she behaves in society. As proof are given examples of the image of women from art of different eras.

Keywords: Image of a woman, women-creators, art, culture, painting, artist, philanthropist, model.

Female images inspired the masters to create immortal works - painters, sculptors and poets sang the anthem to women at all times [3]. The theme of a woman, her inner world and attitudes towards her in different historical eras has always occupied a special place in the visual arts. Since ancient times, women creators created works of art on a par with men, but their achievements were often diminished. So why is female art worth only a tenth of the male? Are their works ten times worse than men's, or are the prices of women's creations constrained by gender discrimination? Some argue that the whole thing is only in quality.

For example, Linda Nokhlin in her 1988 work, "Women, Art, Power and Other Issues," writes: "The fact is that, as far as we know, in the history of art there was not a single one of the most outstanding women, although there were many interesting and very good ones ... This is regrettable, and no matter how much manipulation of historical facts or critical assessments takes place, this will not change the situation, nor will there be any accusations of chauvinistic distortion of history by men. There are no women equal to Michelangelo or Rembrandt, Delacroix or Cezanne, Picasso or Matisse, de Kooning or Warhol" [15].

Others argue that the best works of female art, to add value to them, are often attributed to male contemporaries (for example, Judith Leister turns into Frans Hals [13], and Camille Claudel turns into Roden [5]) and that female art is always was underestimated, as most buyers of art are men, and many men traditionally do not believe in women's ability to create masterpieces.

The role of women in art has changed over the centuries, and the stages of changing their status are worth considering. Was there a time when women did not engage in art? Of course not - from the moment a person first mixed clay with resin, made coal the first contour and fashioned an awkward figure, more than a thousand years have passed. And all this time, women also drawn, painted, embroidered and laid out intricate ornaments. But women's creativity was often perceived as less serious or important, and only with the advent of the Renaissance did the destruction of this stereotype begin.

During the Renaissance, several female names appeared among artists, such as Lavinia Fontana and Sofonisba Angissola. Humanism has promoted the status of women.

Sophonisba Angissola, Italian artist of the Renaissance, the first painter, a woman who studied with Michelangelo, who achieved international fame, invited by the Spanish king Philip II to become a court painter. We have heard 50 of her works, magnificent portraits, including Titian and his wife (Titian respected her, by the way). It was she who became the initiator of the genre of family portrait. Probably a person like Sofonisba could appear only in the Renaissance and not in any other era ... The life story of this artist is no less, if not more, amazing than her talent.

Sofonisba was born in 1532 in the city of Cremona, which is located in Italian Lombardy. After some time, Sofonisba became known outside of Italy. In 1559, the King of Spain, Philip II, invited her to teach art to Queen Elizabeth Valois, who was then only 14 years old. Young girls became good friends, and for the next 20 years Sofonisba worked at the Spanish court [14].

Sofonisba painted a double portrait - "Bernardino Campi, painting Sofonisbu Angissola" (c. 1560). The fact that Campi's hand in the portrait touches Sofonisba's left chest is sometimes interpreted as an expression of cordial affection between the girl and the teacher. Another interpretation of this picture is this: the picture was painted in gratitude to the master who created Sofonisba, as an artist.

"Boy bitten by a crab" is a picture for which, according to legend, Michelangelo set the theme and then praised it very much. Michelangelo subsequently gave Sofonisba sketches from his notebooks to give an idea of his own style and as a kind of "reference book".

Although Angissola received more encouragement and support than the average women in her days, the social class of Sofonisba did not allow her to go beyond the limits of her gender. Without the possibility of studying anatomy or drawing from nature (looking at a nude was not permissible for a lady), she could not take on the complex multi-figure compositions necessary for large-scale religious or historical paintings. Instead, she experimented with new portrait styles. Self-portraits and family members were the most frequent plots of her paintings.

In her self-portraits, Sofonisba was quite careful: she created her own image, which was "worthy, serious and seasoned." She avoided any display of vanity or wealth, usually associated with women of her class. Her hair was always neatly combed, braided and fixed close to the back of her head. There were also no golden curls and curls knocked out of her hairstyle, which were widely recognized as "the quality of ideal female beauty", on her carports.

But whoever artists, art theorists and its consumers would consider it, and orders came. Of course, mainly on portraits (although she also wrote biblical stories). Here again I need to say thanks to the pope - even before his daughter left home from his father, he sent her paintings to the mass of necessary people, up to the Pope. She painted a portrait of the "pacifier of the Netherlands" - the Duke of Alb. And so fortunate that he recommended that King Philip invite the artist to Spain [14].

Sofonisba's works, especially those where she portrayed a family or herself, are different from what was customary to paint at that time. For example, in the painting "A Game of Chess", she paints her sisters Lucia, Minerva and Europe in a completely homely atmosphere, without the image of some pathos and exaltation of the hero of the canvas, which was so popular at that time. The girls in the picture, although dressed appropriately, have fun and play chess, which is not at all characteristic of the then Italian fashion. In self-portraits, Sofonisba deliberately emphasized

her status as an artist and an educated woman, portraying herself with a palette, then with a book, which usually was not done by male artists of that time.

For the art historians and artists of the next generation, Sofonisba Angissola has become a very important symbol, showing by her example that a woman in art, even of that time, can achieve a lot.

XVIII century in the Russian state - the reign of the great woman - Catherine II. That period was marked by serious transformations of the social structure, legislative framework, industry and culture. Among the cultural and historical events within the country are the further development of national manufactories, the establishment of the Smolny Institute, the Moscow Educational House, the new charter of the Academy of Arts. An important role in this era of Catherine II was played by the active and diverse historical, cultural and artistic ties of Russia and Western Europe, including the contacts of the empress with the largest French encyclopedists: Didro, Voltaire [2].

The crowned collector was interested in almost all types of art, but only of the best quality. She bought from well-known masters of her day, and ordered a lot of things for her agents - paintings, icons, rare books, porcelain and metal objects. The patroness of literature, education, theater and art, the Russian Empress Catherine II understood a lot about paintings and collected them for many years. Her collection of paintings makes up the bulk of the funds of the State Hermitage Museum.

This time is called Russian enlightenment. Over the 34 years of rule, the country has developed in all areas, including education, art, legislation. The Empress was one of the greatest philanthropists in Russia. Catherine II carried out a reform of education, inspired by the ideas of enlightenment. According to her understanding, for the prosperity of the state, it was vital to improve the quality and quantity of knowledge among subjects. Understanding the colossal scale of the country and the slowness of both the state apparatus and the prejudices of society, the empress introduced new laws gradually. First of all, educational programs were introduced for representatives of the nobility and citizens. Special attention was paid to the problem of abandoned and street children.

In 1763, Ivan Ivanovich Betskoy was appointed the main adviser to Catherine II in the field of education - this figure became the main one in all matters of the school reforms of the Catherine's era.

1764 - the year the construction of the "Educational House for Foundlings and Street Children" began. The empress allocated 100 thousand rubles for the construction and determined an annual funding of 50 thou-

sand. In addition, Betskoy himself allocated more than 150 thousand, and the well-known philanthropist P. A. Demidov donated about 200 thousand rubles. It was supposed to train students in various crafts, preparation for public work. Students graduated from free people. In the same year, the first educational institution for women was organized - the Educational Society of Noble Maidens, located in St. Petersburg at the Smolny Monastery. It was supposed to teach girls from the age of 5-6 years, teaching them good manners, languages, various art [6].

Another school for boys was established at the Academy of Arts. In 1765, an open college for boys at the Academy of Sciences.

In 1766, Catherine II, together with Betsky, developed the document "The new charter of the land cadet corps." Created under the influence of the ideas of such European enlighteners as Montesquieu, Rousseau and Montaigne, the charter envisaged 10-12 years of education for children adopted at the age of 5-6 years. The peculiarity of the educational process proposed by Betsky was the almost complete isolation of students from the influence of the external environment (only infrequent visits with relatives were allowed inside the educational institution).

Despite the fact that the charter was created for pupils of the cadet corps, its elements were supposed to be used for teaching in civilian educational programs.

According to the charter, all subjects were divided into four categories [4]:

Guiding to knowledge of other sciences (logic, mathematics, the basics of physics, mechanics, eloquence, geography, history)

Preferably needed for a civil rank (popular, state and natural law, moral education, state economy)

Useful (general and experimental physics, military art, tactics, chemistry, artillery and the theory of defensive fortifications)

Arts (all types of art - modeling, drawing, dancing, fencing, architecture, etc.)

In 1772, the Imperial Commercial School was opened for merchants and raznoshintsev, as well as the St. Petersburg Educational House.

Another famous figure that influenced the formation of Russian education was Fedor Ivanovich Yankovich de Marievo, a Serbo-Croatian teacher who developed a teaching system for the Slavic population of Austria-Hungary.

Created by decree of Catherine II in 1782, the "Commission for the Establishment of Public Schools" developed by 1786 the "Charter of Public Schools of the Russian Empire."

Despite such a significant contribution to the promotion of culture and knowledge, the educational policy of Catherine II cannot be called completely successful. Even not counting the peasantry left out of business (up to 90% of the population of the Russian Empire), most of the nobles used the services of individual teachers invited from abroad, or sent their children to foreign educational institutions. Many parish schools existed only on paper. Main and small schools were under the control of Orders of public charity - a chronic lack of funds affected the quality of teaching materials and the material base in general, which reduced the overall level of training for both students and teachers.

In addition, the empress did not allow encroachments on her own understanding of the ideas of enlightenment [6].

The development of art is impossible without models.

Model – someone who poses for any visual artist as part of the creative process. The most common types of artwork that models use are the depiction of a figure, the depiction of a human body, sculpture, and photography, but almost any medium can be used. Models are often considered muses, a source of inspiration, without whom art would not exist.

Contrary to the popular belief that only young and fresh girls reach the heights in the modeling business, more than one name of supermodels has recently been known, who are far from only 20, but also 40. Therefore, there are some exceptions to this industry. One of the most striking is undoubtedly Daphne Self [11].

Daphne Self was born in the British city of Reading. Today it is the most oversized, so to speak, supermodel in the world. At eighty-two, she still works as a fashion model and model, proving that years are not a hindrance to success in this profession.

Daphne began her career in 1950 when she turned 20 years old. The girl then worked in the department store of her native city. Colleagues insisted on her participation in the beauty contest, in which she subsequently won first place. So, the beginning of a modeling career was laid by participation in a local beauty contest. According to the model herself, Daphne Self in her youth was not as fragile and elegant as the current queen of the catwalk, but her figure was considered ideal. A pretty role in the success was played by a pretty face and luxurious hair. According to Daphne Self, they owe it to their Irish roots.

After that, she began to act in advertising campaigns, working as a model for furs and clothes. With a height of 170 cm and a weight of 63 kg, Daphne did not consider herself fat, employers never asked her to lose weight; then for them the parameters of her figure were ideal. However, Daphne Self did not reach much popularity and demand at that time.

A few years later, the model successfully married, left the profession and gave birth to children. However, the love of the fashion world remained with her forever, and Daphne continued to go to shows already as a spectator. This continued until she was 55 years old. This period of life was very difficult for her. Beloved husband became seriously ill, and Daphne carefully looked after him to the last.

Already in 1998, at the next fashion show, by no means young Daphne, the representative of the modeling agency noticed and called the woman the next day, offering a job. At first, Daphne decided that this was a practical joke, but after that she believed and accepted the offer. From that moment, her career began to develop rapidly, and the start was the appearance of Daphne on the cover of *Vogue*.

The model believes that the secret of her success lies in luxurious gray hair, a slender figure and "strong Irish bones." Daphne participated in the advertising campaigns of Nivea and Olay, starred in photo shoots for the magazines *Maria Claire* and *Vogue*.

In 2002, she signed a contract with the D&G model house. By this moment, she is 73 years old and Daphne has long been a grandmother of 4 grandchildren, but an aged model quite successfully advertises a youth collection. For one shot from the photographer Mario Testino, she receives 40 thousand pounds, and the British designer Vivienne Westwood invites Daphne to complete her show in a bride's dress. Today, on one shooting day, she earns about 1,600 pounds. This is unbelievable, but she continues to wear short skirts and heels in the nineteen ten. Most women believe that age-related changes - gray hair, wrinkles, skin pigmentation - must either be hidden or eliminated. Daphne never did either; she boldly exposes herself for all to see, challenging and proving that a woman can be beautiful and successful at any age.

The model often shares the secrets of maintaining health. She is not going to leave the profession, hoping to prove to everyone that fashion has no age. To maintain her shape, Daphne regularly practices yoga, does not like noisy parties and advises her young colleagues not to abuse alcohol, and also to refrain from using drugs. Its main diet consists mainly of fish, vegetables and fruits. According to Daphne, her young colleagues only experience admiration and respect for her. Their age is too different for rivalry. Models like fame, and her new life motto: "enjoy while you can" [11]. She claims that in recent years she has never had to hear laughter and feel infringement of her rights because of her age.

Today, Daphne Self is still in demand among fashion brands and glossy magazines. At one time, she graced the pages of *Vogue*, *Harper's Bazaar* and *Vanity Fair*. She recently starred in a *Dear to Wear* ad campaign for the *Trafford Mall* in Manchester.

Daphne Self for her model life tried on a lot of outfits of various styles and developed her own, individual, which she called "chic funk." She does not hide that in her youth she was not as elegant as she is now: "Only with age does a sense of style manifest itself." Success - in wrinkles and gray hair Daily proving that age is not a hindrance to true success, which lies in gray hair, an elegant figure and good genes, Daphne Self advertises youth clothes, and Vivienne Westwood invites her to complete her show with a bride's dress [11].

With the help of Daphne Self, cosmetic campaigns expect to attract the attention of representatives of the older age group to their products, which means that in the coming years the model will be provided with work.

Daphne Selfie is one of the most unusual representatives of her profession, and therefore - a world celebrity. Her work with photographers is another example for women who put an end to themselves when the first signs of aging appear, how wrong this decision is.

Korobeinikov A. in his article "Life and Career" published in 2019 notes that female images in Russian art are both the first images of saints and martyrs on icons and frescoes, and magnificent ceremonial portraits of Russian empresses, and images of peasant women, and portraits of smart and independent Russian women who enthusiastically mastered new activities and ultimately changed their fate and the fate of Russia. The works of the second half of the XIX century presented at the exhibition clearly outline the circle of women's life, analyze its main stages: childhood and adolescence, betrothal and marriage, the birth of children and the loss of a husband, raising grandchildren, and sometimes lonely old age. Female work in all its diversity has turned into an object of intense interest, whether it is the work of a seamstress or embroiderer, laundresses or peddlers [8].

Masalimova T. in the article "Woman in art or art in woman?" Notes that until the XX century the world of art was more dominated by the male part of society. The woman was assigned the role of a muse in him, but not a creator, although there were isolated exceptions. But the XX-XXI centuries gave people a whole bunch of women artists, poets, musicians, sculptors, writers, actresses and directors. A separate category should include ballet, where a woman has long held worthy positions [9].

In the article "Images of Women in Chinese and Belarusian Art" published in 2019 in the Bulletin of the Belarusian State University of Culture and Arts, for the first time in Chinese and Belarusian art studies, the experience of comparative analysis carried out on the basis of plastic (painting, sculpture) and musical (opera and ballet) is presented) art in order to establish general trends in the development of the artistic culture of the two countries. Separate features of similarities and differences in the

interpretation of the image of women in works of military and revolutionary subjects were revealed [10].

American scientists Margaret Henning and Ann Jarden depicted a portrait of the ideal "Ladyboss". In their opinion, the female leader is a bright personality, she is feminine, not cold and not cruel, physically and intellectually developed, she makes decisions. She is purposeful, self-confident, willing to take risks, and adequately responds to criticism and comments. Able to quickly switch from one social role ("business woman, leader") to another ("mother, daughter, wife") [12].

Ilyin E.P. argues that in the modern world the issue of gender inequality is one of the most acute topics in any field of activity. Art did not stand aside - the National Museum of Women's Art in Washington recently conducted a study, thanks to which it turned out that in private galleries only 30% of the works done by women are presented. And the Artsy online platform dedicated to art and education, which in collaboration with Gucci has released a series of videos in which artists discuss gender roles in art [7].

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PHENOMENOLOGY OF THE STATUS OF WOMEN IN THE SPACE OF ART AND CULTURE

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Abstract. This article is devoted to a comparative analysis of the social roles that a woman had in the field of art and culture as the historical conditions surrounding her transformed. The most important aspects of a woman's functioning, prerequisites for changing her status, as well as factors organizing the field of her activity in the two above-mentioned planes are touched upon. The article represents the genesis of a woman in the artistic process: from an observer to a direct participant. Selected research issues are interdisciplinary, since they cover the issues of cultural studies, art history, philosophy and sociology.

Keywords: author, dialogue, woman, art, muse, craft, socio-cultural space.

In light of the latest trends that have spread among the representatives of the information society, the question of the role and status of women in various areas of life, including art and culture, regularly comes to the fore. According to the statements of the Soviet cultural scientist *Yu. M. Lotman* (1922-1993), the image and character of a woman combine the outstanding features of the surrounding historical and sociocultural situation, which is why for a long time she was interpreted in the context of two well-established social roles: "Woman is wife and mother - to the greatest extent connected with the prehistoric properties of man, with the fact that it is deeper and wider than the prints of the era. Therefore, the influence of women on the appearance of the era is contradictory, flexible and dynamic. Flexibility is manifested in the diversity of female relations with the era" [5; P. 60]. A little earlier, a similar thesis was found in the founder of the hermeneutical tradition, *W. Dilthey* (1833-1911), who was convinced that understanding the life of any person is directly related to the historical context within which his creative and activity potential is realized.

It should be noted that a woman was not considered an independent historical and cultural phenomenon until the beginning of the XVIII century, marked by the reforms of Peter the Great - often her role was tied to her husband's social status or not indicated at all, which indicates a gender inequality, which subsequently had a significant impact on the art market. More detailed concepts about the preservation of a woman's personal identity under continuous imposition of behavioral patterns are observed in the XX century - mainly, they arise in the circle of representatives of literary trends in art. Some of them, in particular, the writers S. de Beauvoir and A. Murdoch, tried by their example to prove that femininity is "the result of the efforts of society to make women dependent on men" [6; P. 239], and gender itself is an ambivalent construct, equally determined by both social and personal needs.

Over the course of history, women artists who have partially stepped out of the shadow of the glory of the male half of humanity during the formation of Renaissance humanism and anthropocentrism have repeatedly tried to solve the above problems. In accordance with the ideological theses of the latter, the author took a supramundane position, becoming on a par with the Platonic Demiurge, possessing the characteristics of an artist and artisan, a mediator between illusion and reality, having the ability to revive material-bodily forms with the help of color. One of the first women who managed to embark on this path is considered the Italian Sofonisba Angissola (1532-1625), whose work was formed around portraiture.

Religious or historical subjects turned out to be inaccessible to her because of the inability to study the anatomical features of the naked body due to the categorical prohibitions of Puritan society. It is also necessary to mention that they prevented Sofonisba from becoming an official student of the famous Michelangelo, who praised the girl's artistic abilities. In the future, her example was inherited by Artemisia Gentileschi (1593-1653) - a member of the Academy of Fine Arts in Florence, daughter of the Tuscan artist Orazio Gentileschi, who in mythological versions (Judith, beheading Holofernes, Susanna and the Elders) reflected the youthful injury inflicted by the late the mannerist and friend of her father, Agostino Tassi. Thanks to her work, a woman was first publicized as a victim of patriarchal foundations, under the influence of which her personal identity is suppressed.

The subsequent era of the dominance of enlightened ideals brought to humanity the names of such masters of portraiture and historical painting as Marie Elizabeth Louise Vigee-Lebrun (1755-1842), Angelika Kaufman (1741-1807) and Mary Moser (1744-1819). The listed girls became famous, as it was customary to consider, in the original male genre, through

which they gained the status of iconic figures of classicism and neoclassicism. For many artists of that time, the level of proficiency in instrumentation and material allowed to attract the attention of monarchs and become court performers with high salaries. In addition to the favorite traditional plots, floral ornaments and miniatures, numerous portraits of royalty and courtiers began to appear in the arsenal of girls. Thus, a woman found herself in close proximity to political life, which she could take into her own hands, rising to the same intellectual level as an educated man: "The era of enlightenment raised the question of protecting women's rights. A woman, a child, a man of the people — these were typical heroes, for the equality and rights of which the enlightener fought" [5; P. 77].

With the advent of romantic mindsets at the beginning of the 19th century, a woman became involved in love affairs, thereby challenging the prejudices of traditional society, as the heroine of the sensational novel J.-J. Russo "Julia, or New Eloise": "Women was never as talked about as in the XIX century. Striking even the brightest minds, this topic has become widespread: in the catechism, legal acts, manuals on etiquette, philosophical works, medical texts, theological treatises and, of course, in literature" [2; P. 121]. Guided by the prevailing position of the phenomenon of public opinion, Rousseau introduces the principle of the so-called "economy of desire" into the sphere of culture and art, which is regulated by hiding, veiling and resistance. A woman should provoke a male desire with ostentatious coldness - which Julia and Pushkin's Tatyana strictly follow. Having experienced the costs of feudal relations in Western European society, the main characters - Saint-Pre and Julia - are forced to develop their love line in the form of letters, diluted with several dates. It should be noted that in the future sociocultural space, letters became the main form of an intimate dialogue between a woman and a man, often supplementing artistic messages: now women are "not only creations, but also creators that constantly influence their processes" [2; P. 117].

The representative of early German expressionism, Paula Modersohn-Becker (1876-1907), proposed to the whole world her model of a woman as a sensitive nature, defined by Lotman as "woman reader", "woman fashionista" and "woman dreamer" [5; P. 50]. Literature is considered to be the legislator of this ideology, which "chose a *non-existent* woman as its object - this highly sensitive and, undoubtedly, a certain symbol, into which men, contrary to themselves, clothed their contradictions and dreams, brought movement to a previously static world" [2; P. 124]. However, now she got the opportunity not only to experience the gamut of various emotions, but to express them through a plastic language. This position harmoniously fit

into the general aesthetic paradigm of the turn of the XIX – XX centuries, within which the painting began to draw the attention of the world community to the problem of self-determination of an individual and collective subject of cognition, as well as to the question of replacing the value categorical-conceptual apparatus. Art, which previously performed a pure contemplative function, from now on has become a kind of archive for unique cultural texts, and the artist has become a spiritual medium, “a prophet and figure who pulls the carriage of mankind’s stuck cart forward” [1; P. 347].

The woman broke free from the shackles of traditionalism, while preserving the pretense of poetry, sung by enlighteners and romantics: “In the era of romanticism, “unusual” female characters fit into the philosophy of culture and at the same time became fashionable. In literature and in life, the image of a “demonic” woman appears, a violator of the rules, despising the conventions and lies of the secular world” [5; P. 86]. However, difficulties as they gained independence were experienced not only by artists, but also by models who played the role of muses of great artists. Despite the fact that this profession was in demand at all times, it acquired a special sentimentalist tone in the context of a new anthropocentric coup, the leit-motif of which was the search for: its inner “I”, the purpose of its existence, its true place in the surrounding reality, the Other. Artists wondered about the search for new pictorial ideals, while their models acted as a guiding thread - it should be noted that the Pre-Raphaelites turned a woman into a “decorative flower” [3; P. 115], with which took an example not only sensual muses, but also women of the highest class.

During the revolution of newly emerging aesthetic concepts, the world came to know the names of Quiz Meran (1844-1927), Suzanne Valadon (1865-1938), Jeanne Hebuterne (1898-1920), Elena Dyakonova (1894-1982), Lydia Delektorskaya (1910-1998), Olga Khokhlova (1891-1955), Camille Donsier (1847-1879), Bella Rosenfeld (1895-1944), Berthe Morisot (1841-1895), Jeanne Samari (1857-1890) and many others, often combining the role of model and artist, thereby corresponding to the stereotype that was widespread at that time about the three main statuses of women in high art: “madonnas, seductresses, and muses” [2; P. 271]. The Impressionists, whose ranks included the aforementioned Berthe Morisot and Mary Cassatt (1844-1926), confidently took up a new interpretation of the aesthetics of the naked female body, which freed the model from gossip in the eyes of society - at least, they pursued precisely this goal.

The result of the introduction of the planned metamorphoses in the space of art and culture of the XX century was the dialectic of a working woman and an idle woman, which later left a certain imprint on the

profession of the model. Over the course of scientific and technological progress, a woman became a full-fledged translator of the fashion phenomenon, as she was involved in the sphere of mass culture, which acts as a guarantor of the choice of a lifestyle and the reconstruction of her own "self." Subsequently, not only artists, but entire fashion houses adopted women's images, proclaiming: "In the past, fashion designers - especially dressmakers - created and sold only dresses. Today we sell a certain lifestyle for the whole world" [8; P. 216]. In contrast to a woman as a labor element, a fashionista, a socialite, was the brightest example of which at the beginning of the last century was Louise Casati (1881-1957), who inspired countless artists, poets and writers - from Jean Cocteau to Robert de Montesquieu.

Finally, in addition to those already analyzed by us, there is a third position of a woman regarding a work of art and culture - the role of a kind of guardian of cultural memory, a philanthropist and art collector. Artworks, as a rule, serve as an indicator of the state of culture - that model of relations, which, according to the Soviet philosopher A. F. Losev (1893-1988), "expresses the fullness and specificity of the stage of historical development" [4; P. 220]. Thus, a woman took upon herself the work on cultural codes and texts, directing the archetypal function of the defender, characteristic of her, to a new direction - however, now it is a question not only of the hearth, but also of spiritual values. It harmoniously fit in with those who asked questions of profitable investment, self-affirmation in the social hierarchy and satisfaction of personal aesthetic needs: back in the 1870s, the trend of collecting works by old masters gained popularity among American oil, sugar and match magnates [9; P. 243], anticipating the founding of the Metropolitan Museum of Art in New York, the Museum of Fine Arts in Boston (both in 1870), the Philadelphia Museum of Art (1876) and the Chicago Institute of Art (1879).

One of the first women in this field historians consider to be Isabella Stewart Gardner (1840-1924) and Nelly Jacquard, better known as collectors and founders of museums. The main task for women was not only acquaintance of visitors with the masterpieces of world art, but also the blurring of the boundaries between the audience and the work, which was ensured by designing the premises in a cozy "home" style. Later, the tradition of philanthropy was continued by the American writer Gertrude Stein (1874-1946) and the gallery owner Peggy Guggenheim (1898-1979), whose names are inextricably linked with the work of modernists and avant-garde artists: thanks to their work, the works of P. Picasso, A. Matisse and J. Pollock.

As a conclusion, we can say that today the list of women collectors and art dealers is constantly replenished - among the most famous places of honor are occupied by the Trustee of the Metropolitan Museum of Art Nita Ambani (born 1963), who received an award for her contribution to his educational and sociocultural life ; Director of the world leader in the modern art market - Christie's auction house - Patricia Barbise (born 1955); the owner of the National Museum of Qatar and the Office of Museums of Qatar - Sheikh Al Mayassa (born 1983), whose last acquisition was the painting "Card Players" by P. Cezanne.

Thus, despite the fact that "the very idea of post-industrialism contains a myth about getting rid of the material, gross, heavy foundation of progress" [7; P. 149], works of art and culture are still the most important sources of knowledge, in accordance with the spirit of the times and through the invaluable contribution of women representing eternal philosophical issues. With the final approval of mass information culture, the relationship between art and a woman smoothly passed into the field of semiotic science, where the latter appears as a style icon (model), an era symbol (artist) and an index (philanthropist), directing history into the mainstream of freedom of the beautiful, exalted, poetic.

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THE MAIN GENOME

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Summary. The driving forces behind the development of the biological world on earth are as bacteria and the physical and chemical factors (environment). A man, like all the biotopes of the planet, is an evolutionary product of bacteria. The dialectic of the biological world development, expressed in the "unity and struggle of opposites", is now more than ever related to these two concepts. The third driving force in this centuries-old biological system is man with his ability to think objectively and sensibly, in which science and religion can help him as ways of understanding the spiritual and material world.

Keywords: bacteria, main genome, ecology, adaptogens, human, multi-resistance, diseases, evolution.

As mentioned earlier, the ratio of the number of genes in humans and the main carrier of genes on the planet - bacteria, is about 1 to 1 million, respectively [1, 2]. That is, one human gene in nature accounts for about one million genes of bacteria living in the human body and the environment. Since bacteria appeared on the planet Earth long ago (perhaps from space) before man (the age of bacteria is 2-3.5 billion years, man - 2.6 million), their role in the formation of the simplest single-celled organisms, plant, animal and human, it is difficult to overestimate [1]. There is no doubt that the quality of human life on earth depends on the quality of life of bacteria. This is evidenced by numerous facts that have come to us from the past. The history of human development, its tragic milestones, are associated not only with wars that claimed millions of lives, but also with epidemics and pandemics that killed no less of the planet inhabitants. The plague, for example, killed up to 75 million people in the Middle ages [3]. Can there be pandemics in our time?

As Nobel Laureate Dr. Joshua Lederberg has stated, "The microbe that felled one child in a distant continent yesterday can reach yours today and seed a global pandemic tomorrow."

In March 2018, the World health organization (WHO) warned scientists and health workers around the world about a new and potentially deadly pathogen - disease X. A list of diseases that could soon pose a threat to the health of most countries was announced. WHO experts called on countries to pay special attention to the study of a number of infectious agents, including Rift Valley fever and Zika, Ebola, Marburg, Lassa, MERS, SARS, Nipah, pathogens of henipavirus infections, CCHF. At the same time, the range of infections, according to experts, can be expanded by new, not known pathogens until. The causative agent of the disease, codenamed "disease X", "...it hasn't even been detected yet, but the looming threat of its appearance has secured it a place on the "most dangerous" list. According to the experts "...this infection is so deadly and mysterious that we don't know anything about it, except that it could be the next global epidemic" [4].

From the point of view of bacteria, pandemics have not disappeared, and moreover, they have become somatic (more serious) character. According to WHO data, more than 60 million people worldwide suffered from diabetes in 2015, but this number increases by 6-10% every year, and a doubling of the incidence should be expected every 10-15 years. In terms of importance, this disease takes the 3-rd place after cardiovascular and oncologic diseases [5]. As well as multi-resistance to antibacterial drugs, for example, in tuberculosis, only in 2018 10 million people got sick with tuberculosis, 1.5 million people died and about 500 thousand fell ill, despite treatment with antibiotics [6, 7].

Adaptation of humans, as well as other macro-and microorganisms of the animal and plant world, to the changing environmental conditions is due to a unique natural mechanism formed in the process of centuries-old evolution. A person with his immune (anti-infectious) and hormonal (e.g., anti-tumor or anti-autoimmune) systems can not react quickly to external factors and in this he, oddly enough, bacteria help. Firstly, bacteria appeared on the planet much earlier than the animal and plant world and their mechanisms of adaptation to changing environmental conditions are faster and easier; secondly, the cycle of reproduction in bacteria significantly (the count is for minutes) differs in time from animals and humans, so the cascade of changes in the genetic apparatus under the influence of external factors are inherited faster: direct division, or in contact with extra-chromosomal inclusions (plasmids) and adaptogens working on the mechanism of bacteriophages or retrovirus-like mechanism; thirdly, the survival rate of bacteria depending on temperature, pH of the environment, radiation, ultraviolet radiation, etc. is much higher than that of humans, animals and plants.

The genetic determinism of all life on earth, associated with bacteria, implies the need to constantly address the essence of the mechanisms that contribute to the relationship and, most importantly, the interdependence between human and bacterial genes. From the point of view of materialistic understanding of new, hitherto unknown forms of existence of living matter ("strange creatures") found in water, underground and other habitats, the mechanism of interrelation and interdependence between bacterial genes and micro- and macro-organisms (single - and multicellular) just explains their non-mythical origin. These organisms are the product of a long local evolution between bacteria and the physical and chemical features of the environment. Therefore, all living beings are built from a single "material" and must be considered with regard to the relationship and interdependence between them. The research vector should be expanded by studying the mechanisms of interaction and interdependence between bacteria and their derivatives (protozoa, plants, animals, humans), on the one hand, and environmental (physical and chemical) factors, on the other. This, in turn, will allow find and link genetic changes in bacteria with genetic changes in humans and, most importantly, to correct infectious and somatic pathology with the help of bacterial genes, using natural mechanisms. In this case, the main role should be played by the skin and intestinal microflora (*Escherichia coli*, etc.) in combination with the environmental bacteria [8].

Thus, it can be argued that the source of the disease (infectious, somatic) originates in the bacteria of the environment as a result of exposure to adverse physical and chemical factors. These genetic changes are instantly transmitted to the same human microflora through plasmids and retrovirus-like mechanisms in the form of adaptogens (a complex of molecular motifs that exceeds the viral one). At this time, viruses appear – markers of unnormal functioning of human systems (respiratory, gastrointestinal, neurological, autoimmune, tumor, etc.). The vast majority of these viruses do not manifest themselves clinically, but as factors of aging or wear of the human immune and hormonal systems are obvious. And finally, the bacteria that live in humans fix and maintain in the genetic apparatus of somatic cells changes that have occurred in the environment.

As regard the treatment of infection diseases, it must be based on molecular motives, mode of action ones had been demonstrated in our publication earlier [2, 9]. In 2018 a professor at the University of Pittsburgh Graham Hatful with her colleagues, confirmed the possibility of treating tuberculosis by the molecular motives in a 15-year-old girl in the terminal stage of the disease, and it can serve as a good demonstration. Moreo-

ver, in recent years, most antimicrobial drugs have become less effective against many infectious pathogens, and we must assert a “post-antibiotic era” has been come.

An example of the existence of a large number of molecular motifs in nature are the data presented at the 68th Annual International Conference “Association of Wildlife Diseases”, held on August 4–9, 2019 in Tahoe City, California (USA), where Zoe Grange et al. published a report: "SpillOver - a new web tool to assess spillover risk of wildlife viruses" (https://wda2019.ucdavis.edu/sites/g/files/dgvnsk4756/files/files/page/WDA_2019_Proceedings_Final.pdf), which estimated that up to 827,000 undiscovered viruses exist in the animal's body. But to our opinion they were not viruses, but molecular motifs, which much less in nature, because they are similar to each other [9, 10] and we assumed that in nature as in music there are infinitely much melodies, and seven notes only.

Artificial intervention in this complex (centuries-old evolutionary process) disrupts the adequate response often. Similar pathogens that have different species, but have separate identical structures, can cause an inadequate response, especially when the main genome, structured by a particular environment, is inadequate to the human genome and requires adaptation to new environmental conditions. This is especially evident when a person changes their place of residence, even temporary. In this case, in the first 2-3 days of living in the new conditions, a rapidly passing discomfort is normally felt.

Thoughtless intervention at the level of the human genome, for example, ill-conceived vaccination, antibiotic therapy, disinfection, etc., on the one hand, and urbanization and technogenic factors, on the other, often disrupt the smooth evolutionary course of environmental changes that form the original biocenotic habitat of micro and macroorganisms. Genetically modified bacteria fix these changes in human genetic material. As a result, the behavioral mood will be appropriate, which, in turn, explains the existence of a material basis for the spiritual state of a person, his direction of reflection and the formation of thoughts [8]. As a result, already on a subconscious level in nature, there is a relationship and interdependence between the human genome, its behavior and subordination to the main genome, the genome of bacteria, which in itself is not surprising.

Materialistic representation and mechanisms of interrelation and interdependence between bacterial and human genes were discussed earlier [2], however, for an adequate and realistic use of these mechanisms in scientific and applied developments will require careful attention to the obtained results, excluding, on the one hand, their inadequate interpretation, and, on the other, use for a double purpose.

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COITAL ANORGASMIA DUE TO DYSONTOGENESIS OF PSYCHO-SEXUAL DEVELOPMENT IN WOMEN

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Abstract. The article discusses the relationship of dysontogenetic sexual dysfunction, maladaptive masturbation and coital anorgasmia in women. The definition of dysontogenetic sexual dysfunction, maladaptive masturbation, its primary and secondary forms, mechanisms of development of coital anorgasmia is given. The treatment options for coital anorgasmia, which developed as a result of the practice of maladaptive masturbation in the pre-doctoral period, are described.

Keywords: anorgasmia, coital anorgasmia, masturbation, maladaptive masturbation, dysontogenetic sexual dysfunction, neurotic sexual dysfunction.

In the context of achieving sexual satisfaction (orgasm), there are two tactics of controlled behavior (masturbation and coitus) and one of uncontrolled tactics (emission in men and sleep orgasm in women).

Masturbation, as a rule, begins to be practiced before the onset of sexual activity, can be modified at any time according to the needs of the individual, and does not depend on the requirements and capabilities of the partner that are mandatory during sexual activity.

At the same time, intimate life implies partnerships, the need to abandon part of one's own requests and requires adaptation to the requests and capabilities of the partner.

Thus, two mechanisms can be distinguished in masturbation: 1) an instinctive choice of tactics and masturbation mechanism long before the moment when the partner nature of sex begins to influence sexual behavior in the process of achieving an orgasm; 2) the lack of influence on the part of the partner in terms of working out a mutually acceptable method of stimulation to achieve orgasm, that is, an adaptive option within the framework of partner sexual function.

Therefore, the choice of technology, primary mechanics (in relation to the beginning of sexual activity), pre-coital masturbation, the characteristics of psycho-sexual development, in which masturbation developed, the formation of adequate and inadequate erogenous zones, the participation of these zones in the formation of future sexual disorders is an important aspect examination and treatment of sexual dysfunctions, especially in women.

[1] suggests dividing sexual dysfunctions into dysontogenetic and neurotic.

Neurotic sexual dysfunctions are characterized by normal psycho-sexual development, on the background of which the mechanisms of neurotic suppression to achieve pleasure, enjoyment, orgasm are manifested. This condition includes conscious control of sex, intellectual efforts to achieve arousal, erection, orgasm, devaluation of the process of intimacy in favor of achieving the ultimate goal - erection, satisfaction of a partner, orgasm. Thus, instead of enjoying in the process, a person is emotionally involved in intercourse without being excited or going through certain stages on the way to orgasm. Instead of pleasure, work takes place that in principle cannot lead to pleasure.

Psychoanalytic theories [2] consider this condition as a subconscious punishment of oneself for "incorrect" sexual behavior in childhood and adolescence.

However, a feature of neurotic sexual dysfunction is the presence of adequate sexuality aimed at partner sex. Sexual dreams and sexual fantasies are adequate, masturbation technique is adequate to partner influences, there is a successful sexual history - even if it is not long or selective for partners. Thus, the treatment of a sexual disorder of this group includes, first of all, psychotherapeutic methods, against which an individual drug complex effect can be developed.

In contrast to neurotic sexual dysfunction, dysontogenetic sexual dysfunction is characterized by weak coital arousal, as usual, natural sexual stimuli are not regarded by the body as stimulating [3]. Reflex chains of sexual arousal do not include sensations that appear during stimulation of adequate erogenous zones, the place of which in the chain is occupied by sensations from stimulation of inadequate zones. Therefore, excitement to the level of orgasm in the context of stereotyped individual or partner stimulation is impossible.

This condition is formed in the process of psycho-sexual development, when the presence of inadequate erogenous zones or the presence of erogenous zones, stimulation of which by tactile action is impossible,

forces the woman to adapt to these features and forms maladaptive masturbation. This masturbation, being a reflection of the main, although inadequate, erogenous zones, leads to strong sexual arousal and orgasm [4], which forms reflex chains of increased excitation and prevents the development of adaptive erogenous zones and methods of their stimulation.

Achieving strong excitement and orgasm in a similar situation is possible through the inclusion of several mechanisms: 1) habitual masturbation during the period of frictions; 2) stimulation by the partner, imitating maladaptive masturbatory sensations; 3) the development of other adaptive first-order erogenous zones that enter into competition with habitual-masturbatory sensations and, ultimately, displace them.

Thus, sexual dysfunction is formed even before the onset of sexual activity, being the primary disorder [5].

At the same time, mixed sexual dysfunction can also form on the background of initially normal psycho-sexual development. Neurotic coital anorgasmia gradually leads to the formation of a "familiar" stereotype of intimacy, the end point of which is the lack of sufficient excitement and orgasm.

Thus, a regressive version of psycho-sexual development is formed in which adequate caresses of standard erogenous zones are ineffective. At the same time, new erogenous zones may form, whose caresses are not included in the picture of neurotic anorgasmia (not provided for in the list of actions that require punishing themselves with anorgasmia), which leads to the formation of a dysontogenetic variant of sexual disorder.

Stages of psycho-sexual development proceed strictly sequentially and at certain age periods [6].

The formation of sexual identity (who am I?) Is completed by 4-5 years. At this age, the child is aware of the presence of sexes, their belonging to a certain sex, the differences between the sexes, physical and social.

The formation of stereotypes of gender-role behavior occurs in 5-10 years (what am I?). The child learns behavioral skills that allow them to be identified by others as a representative of a particular gender.

Formation of sexual orientation from 10-12 to 25 years old (with whom am I?). Sexual orientation and sexual preferences are formed (sexual role). At this point, three stages are distinguished: the formation of a platonic libido, the formation of an erotic (romantic) libido, the formation of a sexual (coital) libido.

Docital masturbation usually begins at the age of 12-14 years, at the junction of the formation of platonic and erotic libido. Masturbation becomes the focal point of combining physical maturation (the level of sex hormones and the development of the body) and socializing factors (pre-

senting new requirements for an aging individual). Thus, a single complex arises, uniting imaginary sexual scenarios and sexual reactions in tactile contact with one's own body [7]. The individual "correctness" of such a merger is confirmed by the achievement of an orgasm, and ideas about partner interaction (sexual intercourse) that facilitate the achievement of this state are also formed.

The beginning of sexual life becomes a test of the developed (imaginary) scenario for adequacy.

Violations of psycho-sexual development at each stage are diverse and clearly reflect the pathology of this particular stage, at the same time, changing all subsequent stages. However, most violations are mild, marginal. They are manifested by erased deviations from normative sexual identity, a scenario of communication with one's own and the opposite sex, choice of a partner, the development of relationships, techniques for stimulating the partner and from the partner, sexual and coital sex. At the same time, a person perceives their condition not as the opposite of a norm, but as a sexual disorder. Their particular sexuality is not recognized, but the person feels insufficient excitement from stereotypical partner contact, and in some cases a clear difference from their own masturbatory practice.

Thus, we can talk about the shift or mismatch of the point of confluence of the bodily and psychological components that occurs during the period of the change in the formation of the Platonic attraction to the formation of erotic attraction, that is, at 12-14 years. In addition, cases of early pre-pubertal masturbation, which is a manifestation of organic disorders of the nervous system, must be separately considered. Pre-pubertal masturbation, as a rule, is maladaptive, since at this age there are still no adequate erogenous zones. The lack of hormonal support for achieving orgasm prevents the straightening of masturbation techniques and, accordingly, the scenario of partner sex.

Complaints of women regarding coital anorgasmia look quite standard: 1. There is no particular excitement when caressed by the partner. 2. There is no particular excitement with frictions in any poses. 3. In the dynamics of intercourse, even with initially strong excitement, an adequate reaction to the affection of the partner and friction gradually decreases. 4. For any duration of the period of frictions, a feeling appears that literally several seconds were not enough before orgasm. 5. A partner cannot reproduce actions that cause arousal and orgasm in a woman during masturbation.

The neurophysiological approach to the issue of increasing sexual arousal and orgasm requires combining and summing up two streams of stimuli: peripheral (bodily) and central (psycho-emotional). This process once again illustrates the unity of the bio-social (bio-psyche) nature of man.

However, an orgasm is also possible with an isolated psychological process - with nocturnal emissions (primarily during erotic dreams). The mental form of masturbation is also known, in which the individual purposefully excites himself only with fantasies, without touching any erogenous zones. On the other hand, special forms of myotonic orgasm can proceed so quickly that a woman does not have time to turn on fantasies and anticipations. Thus, there is a third option of maladaptive masturbation, which is an indicator of an existing disorder, as well as indicating the possibility of targeted treatment of sexual disorders.

Any and all approaches to the treatment of sexual disorders should be guided by the possibility of adapting to the partner version of coital sex within the framework of standard coition. Otherwise, we can only talk about a replacement variant of intimate behavior in a couple or even in a single patient.

Therefore, the therapy of coital anorgasmia as a result of maladaptive pre-coital masturbation should include the participation of a regular partner as a co-therapist conducting a course of partner (marital) sex therapy. The recommendations given initially to the woman herself should be modified quickly enough for the couple in order to strengthen the central mechanisms of arousal - psycho-emotional mechanisms.

We conducted similar courses to 29 women in whom coital anorgasmia was a manifestation of dysontogenetic development. All women reached orgasm with myotonic stimulation within 1-8 minutes. All women had a regular partner, located to solve the problem. All women noted a weak erogenous sensitivity of the erogenous zones of the genitals.

The therapy consisted of creating a stimulus for the manifestation of adaptive erogenous zones and developing personal and partner tactics for stimulating them. In addition, psychotherapeutic efforts were made to enhance the importance of partnership in the intimate process.

Manipulations on their genitals led to the awakening of erotic sensitivity in 18 women (62%), in 6 women (21%), the main erogenous zones were awakened in the area of the mammary glands and anal region, in the remaining 5 women (17%) the erogenous sensitivity of genital and other erogenous zones were low.

Partnerships for all women were twofold: "good" out of an intimate atmosphere, and with claims to a partner in sexual intercourse. Claims consisted in his inability to "correctly" caress them, premature ejaculation, neglect of the interests of women, etc. However, in the process of sex therapy, the efforts of men were evaluated with greater adequacy and positivity. The work of a sexologist to change the assessment of the partner in

all cases led to a significant increase in the positive assessment of both the personality of the partner and their efforts to overcome the existing situation.

Marital sex therapy program was limited to 90 days. As a result of dynamic observation and correction of the actions of the spouses, as well as the individual efforts of the woman, 22 women (76%) noted the appearance of increasing excitement with standard caresses on the part of the husband, as well as an orgasm with coitus (with coitus with additional clitoral stimulation). The initial percentage of orgasmicity in this group is up to 25%.

4 women (14%) achieved increasing excitement and orgasm with the help of her husband, but only against the background of myotonic actions, which underwent some changes. Women of this group refused to further modify the state of erogenous zones.

3 women (10%) did not notice changes during the course. All of them regularly stopped the recommended actions, and were not significantly stimulated to achieve the goal through any kind of manipulation.

Thus, coital anorgasmia, as a result of maladaptive masturbation as part of the dysontogenesis of psycho-sexual development, can be corrected as part of an individually conducted conjugal sex therapy. Efforts should be aimed at strengthening both streams of erotic stimuli: peripheral (bodily - training and awakening of adequate erogenous zones) and central (psycho-emotional - enhancing the importance of partnerships and the decisive role of men in intimate processes).

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IGE-INDEPENDENT PERSISTENT ALLERGIC RHINITIS: ASPECTS OF DIAGNOSIS AND TREATMENT

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Annotation. The chronic course of allergic rhinitis, unstable remissions and frequent exacerbations, tendency to complications and refractoriness to traditional methods of treatment suggest that the disease occurs against the background of immunodeficiency – a favorable factor for the development of bacterial superinfection on the damaged mucosa of the nasal cavity. The article is devoted to the current problem-chronic non-IgE-mediated allergic rhinitis caused by allergen-specific lymphocytes or IgG antibodies with the formation of immune complexes. The author reveals the content of the concept "chronic infectious-dependent allergic rhinitis". The article highlights and describes its characteristic features, discusses the key stages of its diagnosis, describes in detail the clinical picture, the results of laboratory and instrumental methods of examination of the patient in this nosology, pathognomonic signs. Special attention is paid to the differential diagnosis of chronic infectious-dependent allergic rhinitis and chronic neutrophilic rhinitis at all stages of the patient's examination. The author comes to the conclusion that if a patient has clinical equivalents of immunodeficiency, it is necessary to conduct additional analysis of anamnestic data, extended clinical examination and special laboratory studies of the immune status. The work is interdisciplinary, written at the junction of otorhinolaryngology, allergology and immunology and will be interesting for doctors of various specialties.

Key words: chronic rhinitis, allergic rhinitis, microbial landscape, immunity, diagnostic algorithm.

A steady increase in morbidity, an early onset, a continuously recurring course and resistance to traditional anti-allergic therapy determines the medical and social significance of allergic rhinitis (AR) [1,2]. Scientists and practitioners around the world for decades have been developing and improving possible ways to treat it. However, an unambiguous

treatment option that could cause a stable remission of the disease has not yet been found. Often, persistent AR (PAR) occurs against the background of a disturbed microbial landscape of the mucous membrane of the nasal cavity, which allows us to consider a bacterial infection as its possible etiological factor. However, the practical significance of infection has not been fully studied [3,4,5]. There is no information about the need to include antibacterial and immunomodulating drugs in the treatment regimen.

A special form of chronic rhinitis in which, under the influence of infectious antigens against the background of impaired immune homeostasis with the participation of all four types of allergic reactions and an autoimmune component, is the formation of persistent immune inflammation, called chronic infectious-dependent allergic rhinitis (IAR). According to the classification of the Nomenclature Committee of the World Allergy Organization (2003), based on the leading immunological mechanisms that initiate and mediate allergic reactions, infectious-dependent rhinitis are non-IgE-mediated, caused by allergen-specific lymphocytes or IgG antibodies with the formation of immune complexes.

In the diagnosis of IAR, a set of examination methods is used: clinical, laboratory and instrumental.

Clinical examination of patients with IAD should include a detailed study of patient complaints, medical history, examination, palpation and percussion of ENT organs.

Complaints with IAR are not specific: nasal congestion, difficulty in nasal breathing up to its complete absence, mucous discharge from the nose, including post-nasal drip syndrome, early hyposmia, weakness, malaise, irritability, sleep disturbance and concentration. IAR is characteristic of a year-round course with no pronounced seasonality, with a slight improvement in the warm season. When collecting an anamnesis, it is possible to identify a family burden of allergic diseases from close relatives (the presence of respiratory and skin allergic diseases, drug allergies), adverse living conditions (dampness, mold in the home) and occupational hazards. Of particular interest are the concomitant (otitis media, dysfunction of the auditory tube, chronic sinusitis, chronic tonsillitis, recurrent bronchitis, frequent SARS) and comorbid diseases (bronchial asthma, atopic dermatitis), as well as the use of drugs that contribute to the violation of nasal microbiocenosis (topical corticosteroids, systemic and local antibiotics).

An endoscopic examination determines the pale pink to marble-porcelain color of the mucous membrane along the entire length of both halves

of the nasal cavity, pronounced infiltrative edema with an increase in the lower and middle nasal concha, and a sharp narrowing of the nasal passages. Edema in IAR, as a rule, is not limited only to the nasal cavity. With a long course of the process, a polypous transformation of the mucous membrane of the nasal cavity and paranasal sinuses occurs. An X-ray examination already in the early stages reveals edema and parietal thickening of the mucous membrane of the ethmoid, maxillary and, to a lesser extent, frontal and sphenoid sinuses.

IAR is characterized by the possibility of joining in a relatively early period of clinical manifestations of bronchial asthma.

If there are characteristic clinical, anamnestic and rhinoscopic signs of AR, the patient is sent to an allergist to determine the treatment tactics and interpret the results of an allergy examination, staging skin and provocative tests, exclude or confirm the presence of bronchial asthma, determine the feasibility of allergen-specific immunotherapy and its implementation. In some cases, specific immunoglobulins E cannot be detected in the patient's blood. This fact suggests that representatives of the bacterial community of the nasal mucosa are antigens in the development of non-IgE-mediated hypersensitivity reactions. Therefore, patients with ARI, characterized by a continuous recurrent course, resistance to traditional antiallergic therapy and the absence of allergen-specific IgE, are recommended to carry out a culture bacteriological examination of smears from the nasal mucosa with determination of sensitivity to antibiotics. The state of microbiocenosis of the mucous membrane of the nasal cavity in IAR is studied in a bacteriological laboratory by seeding microorganisms on differential diagnostic media.

If the patient has clinical equivalents of immunodeficiency, it is necessary to conduct an additional analysis of anamnestic data, an extended clinical examination and special laboratory studies of the immune status. First of all, it is necessary to take into account certain data from the results of routine analyzes of peripheral blood, namely the presence of the following indicators: signs of prolonged or chronic anemia, lymphocytopenia or lymphocytosis, eosinophilia or aneosinophilia, thrombocytopenia and leukopenia, hypo- and agammaglobulinemia, violation of the interdependence of the associated hemogram parameters (normal expressed leukocytosis and neutrophilia or, conversely, unchanged indicators of a general blood test in a clinically severe course of the disease). A study of the immune status should include an assessment of cellular (T-link) and humoral (B-link) immunity, as well as an assessment of non-specific defense factors.

Immunological examination of patients with IAR indicates immunodeficiency with a decrease in the number and functional activity of T4 helper T4 and cytotoxic T8 T8 killers, serum disimmunoglobulinemia G, M, A, a decrease in the number of NK cells, a decrease in phagocytosis and a weakening of mucosal immunity in the form of a decrease in sIgA in the nasal mucosa [6,7].

IAR markers are mediators of immune eosinophilic inflammation of the nasal mucosa represented by RANTES chemokines (Regulated upon Activation, Normal T-cell Expressed and Secreted), eotaxin, ICAM-1 adhesion molecules (intercellular adhesion), and VCAM-2 (vascular adhesion IL) cytokines -5, TNF- α , leukotrienes and others, the presence of which is not characteristic of banal chronic (neutrophilic) rhinitis [8].

The pathognomonic sign of IAR is the detection in nasal secretions, in blood plasma, in a biopsy of the nasal mucosa and in polyps of degranulation products of activated eosinophils in the form of eosinophilic proteins: ECP (eosinophilcationic protein) - eosinophilic cationic protein, MBP-1 (major basic protein) [8]. In banal chronic (neutrophilic) rhinitis, eosinophil degranulation does not occur, remodeling of the nasal mucosa is not observed.

The chronic course of AR, unstable remissions and frequent exacerbations, a tendency to complications suggest that the disease proceeds against the background of secondary immunodeficiency. Secondary immunodeficiencies are the main target of immunomodulating therapy. The most promising and effective immunotropic agents include high molecular weight immunomodulators from the chemically pure group. The inclusion of a synbiotic in the treatment regimen is due to the key role of dysbiosis in the pathogenesis of atopic diseases. The work of foreign and domestic researchers in recent years has shown that allergic manifestations are the result of complex interactions between genetic, epigenetic, environmental factors and microbial effects [9, 10, 11]. The restoration of intestinal microbiota serves to prevent and treat this pathology and to protect against manifestations of atopy. The positive effect of a topical immunomodulator on the course of AR was shown in a study by Yu.Yu. Samuylova. In the dissertation, the researcher substantiated the effectiveness of his appointment to patients with AR [12]. Therefore comprehensive treatment with the appointment of an immunomodulator, an antibacterial drug, a synbiotic and a local bacterial lysate, and elimination therapy is recommended for moderate and severe patients with moderate to severe clinical changes in the composition of the bacterial microflora of the nasal cavity.

Conclusions:

1. The chronic course of allergic rhinitis, unstable remissions and frequent exacerbations, a tendency to complications, refractory to traditional methods of treatment suggest that the disease proceeds against the background of secondary immunodeficiency, and the cause of the atopic process is an infectious antigen.
2. If the patient has clinical equivalents of immunodeficiency, it is necessary to conduct an additional analysis of anamnestic data, an extended clinical examination and special laboratory studies of the immune status.
3. Medium and severe PAR patients with clinically significant changes in the composition of the bacterial microflora of the nasal cavity are recommended complex treatment with the inclusion in the treatment regimen of an immunomodulating drug, an antibacterial drug selected taking into account the sensitivity of the seeded microorganisms, a complex drug for elimination therapy with antimicrobial and antiviral effects, synbiotic and local bacterial lysate..

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**ASPECTS OF THE ACTION OF HORMONES OF CIRCADIAN RHYTHMS
AFFECTING THE BODY OF A PERSON EMPLOYED AT NIGHT**

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The issues of body activity in the cycle of "sleep and wakefulness" have always been discussed in the scientific world with a particular interest. Over the past decades intense scientific researches in this area have been carried out and the hormones serotonin and melatonin have been studied thoroughly. Three years ago the scientists who had been studying the issue received a number of prestigious awards, including the Nobel Prize.

The human body has the unique ability to rehab (recover) in the dark, since it is only in the sensory deprivation mode, with eyes closed, that pigments work in cooperation with the visual center and pineal gland. This is how melatonin, which provides a person with a good rest, is produced. If there is lack in its production, human health undergoes a number of difficulties. These aspects will be discussed below.

Scientists have proved that working night shift leads to metabolic and catabolism disruption and sometimes even to a significant lack of energy consumption, compared to day work energy consumption. Observations have proven that night work usually involves consumption of junk food, which leads to overweight. In this article, we are going to consider the medical aspects of this issue. The consequences of working night shifts are often presented by further disturbances occurring in the body:

- Disruption of the cardiovascular system (atherosclerosis, hypertension, angina pectoris, heart attack, stroke, hypertensive crises. Moreover, the probability of exacerbation of the disease increases several times if the person having such symptoms continue working

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- Diabetes development (a metabolic disorder and an increase in glucose in blood occur, as well as the appearance of abdominal fat, which leads to obesity when the body mass index begins to exceed 29.99).

- Development of mental disorders (increased serotonin, which worsens mood and accelerates distress).

- Diseases of the gastrointestinal tract (the development of gastritis, peptic ulcer, IBS and other diseases.)

- Effect on pregnant women and the reproductive system (increase in the number of miscarriages, complex births, menstrual disorders, hormonal dysfunction).

- Oncology (night wakefulness increases the carcinogenic factor, since the production of the melatonin hormone is suppressed)

Therefore, schoolchildren, pregnant and lactating women should avoid this regimen. It is necessary to consult the following medical specialists:

- cardiologist
- gynecologist-endocrinologist
- endocrinologist
- other specialists if a person's condition requires that.

Daily fluctuations - circadian rhythms or a cycle of "sleep and wakefulness", which determine the changes in the body depend on the following factors:

- Environmental
- Physical
- Cognitive
- Social
- Financial
- Genes
- Hormonal.

The latter factor is fundamental, since melatonin hormone, which is the stimulus of the circadian rhythm process, is vital for a human body, as well as serotonin, which has a direct biochemical systemic link with melatonin.

Melatonin regulates the frequency of sleep, but not its occurrence. Melatonin is produced at night while in the light its synthesis is reduced. Synthesis is developed not only in natural daylight, but also in artificial light, but at a considerably lower level.

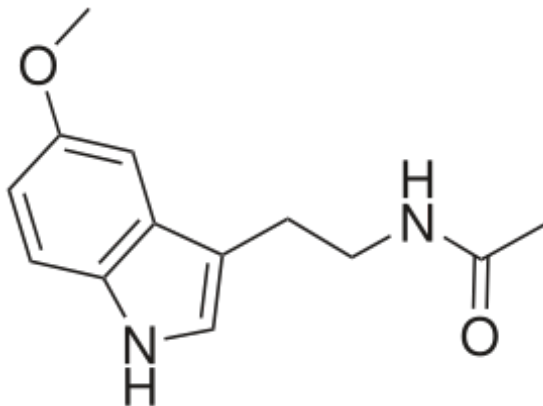
Production of serotonin requires a person to spend about an hour a day in the fresh air. Serotonin levels determine the level of melatonin. With low melatonin, nighttime employees are harder to recover through sleep, which affects their psychological well-being. The pineal gland is a source of melatonin. From there, it enters the bloodstream, where its concentra-

tion changes throughout the day. After midnight, the concentration of the hormone is significant. Closer to the morning time, at about five o'clock, a decrease in melatonin levels beg



Pic. 1 Serotonin

Melatonin is a complex action hormone that affects the whole body. Melatonin membrane receptors are functionally responsible for regulating circadian rhythm. Antitumor effects play the most important role. The production of the melatonin hormone is determined by a season. In winter, it is much less than in the spring and summer. The base stock of melatonin in a human body changes throughout a person's life. Quite a significant amount of this hormone is produced in childhood, but during puberty it decreases.



Pic. 2 melatonin

Process Management and Scientific Developments

Melatonin has a number of important physiological and biological functions:

- regulates the human psyche
- relieves anxiety
- reduces stress
- shows a powerful antioxidant effect due to permeability through the cell membrane
- neutralizes the effects of the interaction of free radicals in various areas
- improves cognitive function of the brain, because it stimulates visual perception
- has an antitumor effect
- resists the development of malignant tumors.

The function of interaction with the central nervous system is also very important. Melatonin is also a neuropeptide and a mediator in the action of signals of suprachiasmatic nuclei and peripheral organs. The pineal gland along with the suprachiasmatic nuclei of the hypothalamus represent the system of the so-called body clock, which plays a key role in the mechanisms of “counting internal time” and aging.

The functions of the pineal gland in the body are:

- regulation of circadian and seasonal rhythms;
- regulation of reproductive function;
- antioxidant protection and antitumor protection.

It is necessary to highlight the biochemical aspect of melatonin. By its chemical structure, melatonin is a derivative of the biogenic amine serotonin, which is formed from the amino acid tryptophan. The pineal gland receives information about the level of light through complex nerve pathways that switch the function of the hypothalamus. Information from the retina through the optic nerve branch goes to the suprachiasmatic nucleus. Further, these signals pass through the hypothalamus in the pathways along the brain stem to the spinal cord. Then the signals, through the sympathetic nerves penetrate back into the brain through the holes in the skull. Then they return to the pineal gland.

At night, a large number of neurons suprachiasmatic nuclei are not active. They secrete norepinephrine, which provokes the release of enzymes. The pineal gland can produce about 30 mcg of the hormone circadian rhythms. Light negatively affects its production while in the dark the daily rhythm of the ejection remains the same. Melatonin is also present in other sectors:

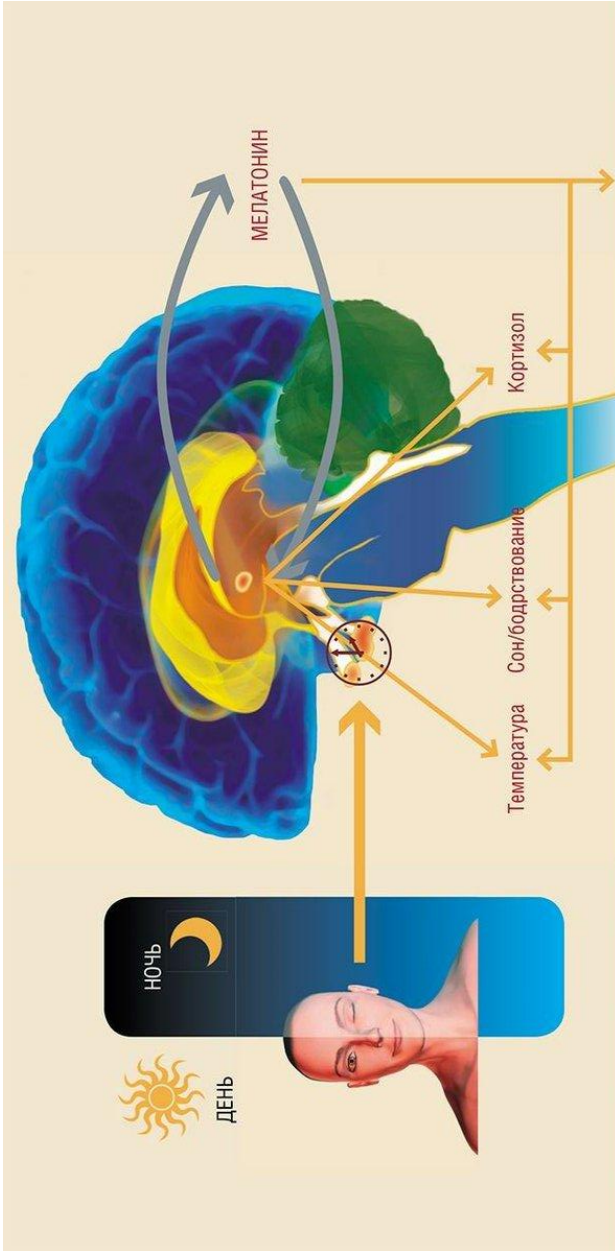


Fig. 3 The effect of melatonin on the body

- thymus
- gastrointestinal tract
- gonads
- connective tissue.

Melatonin has a significantly higher antioxidant activity in terms of interrupting the processes of lipid peroxidation and inactivation of the active free radicals $-OH$ and $ROO-$ than the known antioxidants. Under the conditions of the initial hyperactivity of the immune system, melatonin in a dose-dependent manner inhibits the formation of a number of cytokines in response to the introduction of phytohemagglutinin and reduces the function of activated macrophages and T-helpers. Melatonin immunomodulation is based on a direct effect through specific receptors on the function of cells of lymphoid organs and cellular elements of the blood, as well as an indirect effect through the mobilization of opioid mechanisms and modification of the production of corticosteroids by the adrenal cortex.

Melatonin has a positive effect on fat and carbohydrate metabolism and reduces the amount of cholesterol in the blood. It is able to normalize the process of lipid oxidation, thus reducing the risk of developing atherosclerosis, is involved in hormonal regulation of blood pressure (BP), reducing the release of ACTH, the production of norepinephrine, vasopressin and renin.

The amount of melatonin changes throughout a person's life. The hormone secretion begins at the 3rd month of the child's development, and its concentration reaches a maximum in the first years of life (no later than 5 years old). Before puberty, melatonin synthesis remains at a constant and high level, then its amount decreases sharply and continues to decrease for another 5 years. After this, changes in the formation of melatonin do not occur until 40–45 years, after which its amount begins to decrease steadily, which coincides with the onset of menopause, and this process continues until the end of a person's life.

Artificially obtained melatonin has been studied in sufficient detail as a pharmacological agent. It is a low toxic compound with LD50 for laboratory animals above 800 mg / kg.

Parenteral administration of melatonin easily penetrates the blood-brain barrier, quickly accumulates in the cerebrospinal fluid and brain tissue. The maximum level of melatonin was found in rats after 1 hour in the mediobasal hypothalamus, striatum and neocortex. In humans, the introduction of melatonin for 1 month, up to 6 g daily, did not cause side effects, except for cramping in some individuals. When used internally, a peak concentration of melatonin is observed an hour after consumption,

and a sufficiently high level in the blood plasma remains for 3-4 hours. The currently accepted therapeutic doses of melatonin in the composition of drugs and dietary supplements are 3-6 mg. Most clinical trials in the world have been conducted using these dosages. Conducted somnological studies allow us to talk about the existence of distinct hypnogenic properties in melatonin and to recommend it as sleep aids. The hypnotic properties of melatonin are closely related to its chronotropic activity, with the formation of a fundamental daily biorhythm. The normalization of sleep also contributes to the anti-anxiety and anxiolytic activity available in melatonin.

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CORRELATION BETWEEN MUZZLE LENGTH AND QUALITY OF THE GRIP IN DOGS OF THE ROTTWEILER BREED

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Abstract. This article analyzes the length indicators of the muzzle of Rottweiler dogs and the quality of the grip on objects of different stiffness. Evaluation of exterior features is an important criterion for admission to breeding, as it directly affects the performance of service dogs. Knowledge of the private exterior, methods for evaluating individual parameters and physique indices allow for a more accurate conclusion about compliance with pedigree indicators. The grip is present in the test standards, allowing to evaluate the working qualities of this breed. Correct grip is influenced by the dog's exterior and performance. A well-coordinated dog constitutionally possessing the necessary type of higher nervous activity is able to demonstrate a good grip on the assistant judge in the "defense" section.

Keywords: rottweiler, constitution, grip, capture, defense, protective sleeve, guard.

Introduction

Service dogs are successfully used to perform official tasks in the dog service of the Federal Penitentiary Service, mainly performing search, detention and escort [2, 4]. The issue of the use of breeds in the practical activities of the internal affairs bodies has been relevant for many years [2]. Rottweiler dog of medium and large size, constitutional type coarse strong, friability and tenderness are not welcome [6]. The Rottweiler is a member of the second group of the FCI International Cynological Federation "Molosso and Mastiff type dogs". Molossoid-type dogs are distinguished by

a wide skeleton, confident behavior, and good protective qualities. The most successful dogs of the Rottweiler breed are used in the guard and guard service, and they are rarely put on guard in our country because of climatic conditions that are unfavorable for dogs with short hair. Modern representatives often move away from the working type, as breeders often neglect the screening and selection of dogs for admission to breeding. The appearance of changes in the constitution entails the loss of working functionality [3]. Representatives of modern “shows” have friability, short snouts, shortened physique format and, as a result, infantility or cowardice in behavior. Dogs with a shorter format show a decrease in life expectancy. To prevent the appearance of dogs with undesirable traits, it is necessary to comprehensively evaluate the exterior and working qualities. There are several ways to assess the exterior of dogs: eye, taking measurements and calculating body indices, graphic, photographing [1]. Measuring dogs is the most objective method for studying exterior features; this method allows you to compare animals with each other and identify the significance of differences [3]. By measuring the length of the muzzle, a dog can be assigned to a group of dogs with a normal muzzle, long or short-faced individuals. To assess working qualities, test standards are used (IGP, OKD + ZKS, OKD + special course), before proceeding with the preparation of the dog for protective sections, it is necessary to identify the presence of grip and temperament, the ability to learn the correct grip, and hold pressure.

The purpose of research

Assess the dynamics of the quality of the grip in Rottweiler dogs when teaching a conflict-free method on playing objects and protective sleeves.

Objects, conditions and methods

Dog training was carried out at the training site of the Kennel College of Moscow State Academy of Veterinary Medicine and Biotechnology named after K.I. Skryabin and on the walking platforms of Moscow in the absence of strong noise irritants. Previously, dogs were divided into groups, dogs with a normal muzzle and short (indicators were about 30% of the length of the cranial part). The length of the muzzle was determined using a measuring tape. The normal muzzles were in 12 dogs, short in 12 dogs. All dogs reached puberty; dogs over two years of age were evaluated. Testing was carried out in the morning. The dog was tied on a long leash of 5 meters, the owner was nearby, who stimulated the dog to capture the item. In the first week of training, the dog was offered a rag made of suede, a month later a rope made of jute, two months later a pillow-grip made of jute, three months later a soft “puppy” sleeve, and after four and a half months a sports sleeve was used (end of training in sports directions). We they checked the work of dogs with compli-

cations - after six months of training they were offered to work on "hidden" protection. After a six-month training session, a familiar place was changed to unfamiliar territory and the assistant judge changed in the "defense" section (defendant), then the work of an extraneous person with increased pressure and elements of non-sporting struggle was evaluated (classes were conducted 5 times with an outsider), entered the last result. Each dog was trained once a week, before the training the dogs were not trained in protection. All results were evaluated at the end of work with the subject on a scale: lack of grip 0 points, insecure grasp of cutters 10 points, confident grasp of cutters 20 points, incomplete grip of 30 points, full grip and lack of pressure retention of 40 points, full grip and long pressure retention of 50 points. The pressure was exerted by the threatening effect of the stack. All results were recorded in the summary sheet. The tested dogs lived in apartments. The average exercise was 2.5-3 hours, feeding was carried out with premium feeds, dogs that received other food were not recorded in the statement, as the performance of dogs is directly related to the conditions of keeping and feeding [5].

Results and discussion

Assessing the ability to develop a grip is an important component for protective sections. For a comprehensive assessment, we analyzed the formation of the correct grip in Rottweiler dogs.

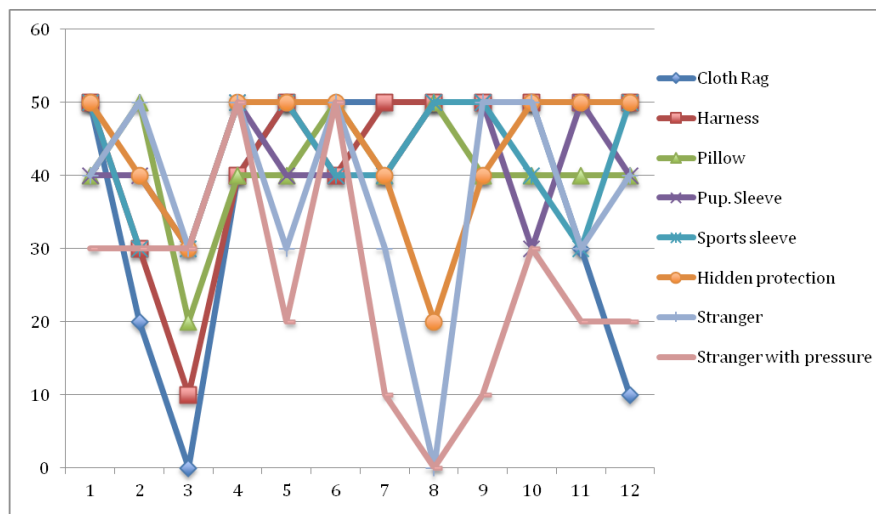


Figure 1. Dynamics of assessment of dogs with a normal muzzle for an increase in the degree of rigidity of an object for grip

According to the data in Figure 1, on average, dogs showed an excellent grip on a rag of 37.5 ± 0.4 points, more than 60% of dogs grabbed an object with a full grip and held pressure with a stack, the performance on a tourniquet was estimated at 43.3 ± 0.2 points, with interested demonstrated a grip on the pillow 40.8 ± 0.4 points. For a grip on the sleeve for puppies, they scored 41.6 ± 0.2 points. When working with a sports sleeve, they scored 42.5 ± 0.7 points, with a hidden protection of 43.3 ± 0.6 , which indicates a good grip. When working with a stranger, they rated the work at 37.5 ± 0.2 points, a decrease in the quality of work was observed, but no significant difference was revealed. When working with an outsider exerting additional pressure on the dog 25 ± 1.2 points, which significantly differs from the result of the end of training, most dogs showed cowardice and uncertainty, a passive-defensive reaction, which is disqualifying for Rottweiler dogs.

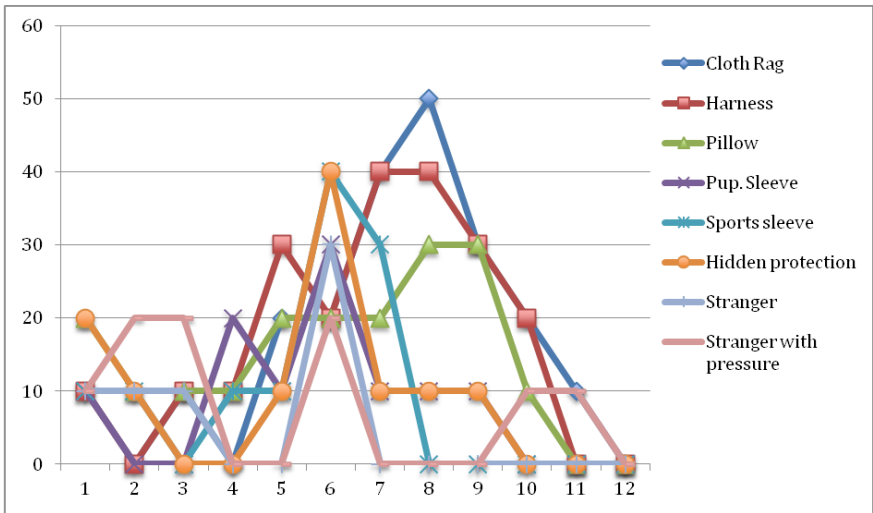


Figure 2. The dynamics of the assessment of dogs with a short muzzle by the increase in the degree of rigidity of the object

By analyzing Figure 2, there is a tendency to the absence of positive dynamics of grip learning on a more rigid surface. When working with a rag, only 2 dogs showed good grip, the group average was 17.5 ± 0.4 points out of a possible 50, dogs grabbed a rag with incisors, which could lead to injuries in subsequent items. Within a month, 4 trainings were held on this subject, then the assistant judge in the “protection” section offered the dogs a tourniquet, the dogs scored 17.5 ± 0.1 points, which is an extremely low indicator, many dogs refused to take the surface even with incisors.

A decrease in activity occurred during training with a pillow-grip 15 ± 0.6 , points. The grip of the sleeve for puppies, which has a fairly soft surface, was reluctant to perform, preferring to bark or refuse to grip at all, the group average was 8.3 ± 0.3 points. When working with a sports sleeve, the dogs scored 9.1 ± 0.3 points, with hidden protection 9.1 ± 0.3 points, which significantly differs from the start of the training, but in the direction of worsening demonstration of grip. When working with an extraneous person involved in the sports sleeve, dogs scored an average of 5.0 ± 0.7 points, most dogs (more than 60%) gave a passive-defensive and indicative reaction, this behavior is disqualifying for protective dogs. When additional pressure was exerted by the person involved, the dogs scored 7.5 ± 0.3 points, this indicator shows excessive cowardice of the dogs.

Table 1. Comparative analysis of the results of dogs with normal and short muzzle

	Normal muzzle	Short muzzle
	$\bar{x} \pm S\bar{x}$	$\bar{x} \pm S\bar{x}$
Work on the sports sleeve (final stage)	$42,5 \pm 0,7^*$	$9,1 \pm 0,3^*$
Work on hidden protection (complication)	$43,3 \pm 0,6^*$	$9,1 \pm 0,3^*$
Work with a stranger (complication)	$37,5 \pm 0,2^*$	$5,0 \pm 0,7^*$
Work with strangers at increased pressure (complication)	$25 \pm 1,2 \pm^*$	$7,5 \pm 0,3^*$

Note: * $P < 0.001$

Analyzing table 1, there is a significant difference in grip in dogs with normal and short muzzles. Dogs with a normal muzzle showed excellent grip at the final stage, but when working with an extraneous person with pressure, the results significantly decreased, which indicates the manifestation of a passive-defensive reaction when working with a strong irritant in conditions close to real ones. Dogs with a short muzzle scored critically low grip indicators, which indicates a loss of working qualities. Many dogs worked with an incomplete grip, holding the object with incisors, which could cause injury when working in real life, there was no grip dynamics in dogs with a short muzzle when training, dogs with a normal muzzle showed progress.

Conclusions

The results of grip production in Rottweiler dogs with a normal face ($42.5 \pm 0.7^*$ points) are significantly different from dogs with a short face ($9.1 \pm 0.3^*$ points).

Dogs with a normal muzzle are suitable for guard duty, dogs with a short muzzle should be disqualified from breeding.

The capture of an object is not always associated with the teaching method, the quality of the grip is affected by the individual characteristics of the animal, the exterior, temperament and characteristics of the nervous system.

The current stock of Rottweiler dogs work poorly at excessive pressure in real life, which indicates a tendency for cowardice to appear in the breed.

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**STUDY OF THE EXTERIOR, CONSTITUTION AND TYPE OF COAT
OF DOGS OF THE GIANT SCHNAUZER BREED OF DIFFERENT
DIRECTIONS OF USE**

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Abstract. In this paper, we studied the exterior, constitution, and type of coat of dogs from the Giant Schnauzer breed of the exhibition and working (sports) areas of use.

Keywords: Giant Schnauzer dog breed, exterior, constitution, type of coat, measurements and body indices, show dogs, working dogs, sexual dimorphism.

For decades, a number of authors have pointed out the problem of separating service dog breeds into exhibition (shows) and workers (sports) lines. [3,5,6,8]

In the Russian Federation, working breeding of dogs of the Giant Schnauzer breed is absent; imported dogs from European countries where this breeding direction exists are found in single specimens.

By the method of observing exhibitions and competitions, including monobreed, over a number of years, it was found that the exterior, constitution and type of coat in dogs of different directions of use significantly differ visually.

Is there a connection between the success of a dog in one direction or another of use and its exterior, constitution and type of coat, if you compare it without regard to the origin (direction of selection), and consider only the effectiveness of the dog?

The purpose of our study: to identify or refute observations about differences in the exterior, type of constitution and type of coat hair of the Giant Schnauzer dogs of the exhibition and working (sports) areas of use.

Tasks:

- Study of specialized literature on the topic of the research.
- Drawing up the research scheme, determining research methods.
- Conducting research - taking measurements from dogs, calculating body indices, statistical processing of empirical data.
- Analysis of the results of the study, the formulation of conclusions

The relevance is due to the almost complete absence of research on this problem on the Giant Schnauzer breed. Many works have been published on the German Shepherd dog breed, confirming the significant difference between working and show dogs, both in terms of exterior and working qualities. [2,4,7]

Novelty. In recent years, studies of the Giant Schnauzer dog breed have not been conducted, the problem of dividing the breed into separate lines depending on the direction of use has been ignored. Some indices, especially head indices, are mostly ignored; in this work, they are studied in detail in the Giant Schnauzer breed.

In this study, we decided to compare the exterior, constitution and type of hair of dogs that have a stable result in two directions: exhibitions and sports training.

Group 1 included dogs (n=8, 4 males, 4 females), showing a stable result in competitions at various levels - from regional to world, according to complex* standards: OKD+ZKS (national Russian standard) and IPO 3. Which means, that these dogs have the working qualities necessary to perform the various tasks included in the complex standard.

* These standards include obedience, protective work, as well as an exercise to work on intuition - sampling or trace work.

Group №2 included dogs (n = 8, 4 males, 4 females) with the title "International Champion" or "Grand Champion" in the FCI system (Federation Cynologique Internationale), that is, they showed stable results at exhibitions of both national and international level. This means that these dogs have an exterior and demonstrate the behavior of a good show dog. Not a single dog from this group is used as a sports one in competitions.

The origin of the dogs in the distribution of the groups was not taken into account. There were no dogs having both successes in sporting performances and exhibition titles. All dogs live on the territory of Moscow and the Moscow region with different owners. They were kept at homes, feeding was different (individual for each dog).

The small number of dogs studied is due to the small number of Giant Schnauzer dogs showing stable results in a comprehensive standard. As a result, animal trainers do not select ripper schnauzers, preferring more successful breeds in sport, such as the Belgian Shepherd Malinois, the German Shepherd of working breeding, the Dutch Shepherd. Only a small number of athletes-trainers remain faithful to the breed, they buy dogs in Germany, the Czech Republic, Austria, where the working breeding of Giant Schnauzers is developed at a high level.

The following measurements were taken from each dog: height at the withers, oblique body length, head length, muzzle length, chest girth, metacarpus, head girth in cheekbones and muzzle girth under the eyes using tools - a measuring tape and ruler. Using these measurements, the following indices were calculated: format, bone, mass, head length, cheekbones length, face length, muzzle fullness, development of the cranial part of the head. Table 1 presents the average values of the physique indices of dogs of the Giant Schnauzer breed of both studied groups.

Table 1.
The average body indices of dogs of the studied groups

Group	FI	BI	MI	HLI	CBLI	FLI	MFI	CPHDI
group №1	101,58* ±1,24	18,03** ±0,31	118,20*** ±1,47	40,34**** ±0,68	65,88 ±1,81	44,03 ±1,13	105,74 ±2,66	160,61 ±2,29
Cv,%	3,2	4,5	3,3	4,5	7,3	6,8	6,7	3,8
group №2	103,43* ±0,56	19,45** ±0,29	120,05*** ±1,73	41,54**** ±0,36	65,48 ±1,06	43,60 ±0,97	105,85 ±3,03	159,33 ±3,28
Cv,%	1,4	3,9	3,8	2,3	4,3	5,9	7,6	5,4

(*P=0,40; **P=0,20; ***P=0,40; ****P=0,20)

According to table 1, it can be seen that in the index of format, bone size, mass and head length, dogs from group № 2 on average outperform dogs from group № 1, however, the difference is not significant due to the small number of dogs in the groups.

Dogs of group № 2 on average have a more elongated format, a more developed skeleton, a slightly more voluminous chest, a slightly longer and less bulky head than dogs of group № 1.

According to the average values of the head indices (cheekbones length, face length, muzzle fullness, development of the cranial part of the head), it can be said that the differences between the groups are insignificant, but a higher variability of these indices than in the body indices may indicate less stable head shape among the dogs studied.

In sport, drier and more compact dogs are preferred, they have greater endurance and movement efficiency, and at shows more successful dogs are more bony and massive- they look much more spectacular in the ring.

In each group, the physique indices of males and females were separately statistically processed to identify the presence and severity of sexual dimorphism. The calculation results are presented in tables 2 and 3.

Table 2.
The average values of the body indices of males and females of the studied groups, %

Group	Format index	Bone index	Mass index	Head length index
№1 males	101,20***±1,10	18,23*****±0,55	115,58*±2,22	41,70**±0,83
№2 males	102,83***±1,03	19,48±0,30	119,90±1,83	41,73±0,49
№1 females	101,95***±2,66	17,83*****±0,43	120,83*±0,84	38,98**±0,46
№2 females	104,03***±0,59	19,43±0,60	120,20±3,60	41,35±0,67

(*P=0,05; **P=0,10; ***P=0,80; ****P=0,40; *****P=0,80)

When comparing the average body indices of males and females in both studied groups, a significant difference was found only in group № 1 in terms of mass index (P=0.05). Females of group № 1 possess a significantly more developed body, a more voluminous chest relative to the height at the withers, than males of the same group. In group № 2, females on average are also more massive, but the difference is insignificant.

In both groups, females on average have a slightly more extended format, which corresponds to the presence of sexual dimorphism. Most likely, this is due to a more pronounced withers, and its more developed muscles in males.

Males in group № 1 have a more developed skeleton than females in group № 1, however they are inferior in this indicator to females from group № 2 (P=0.40). Males of group № 2 on average slightly exceed the females of group № 2 in this indicator.

In both groups, males on average have a slightly longer head, relative to height at the withers, than females. In group № 1, this difference is more pronounced.

Based on the foregoing, we can conclude that sexual dimorphism in groups is expressed, in group № 1 it is more pronounced than in group № 2.

Table 3.

The average values of the body indices of males and females of the studied groups, %

Group	CBLI	FLI	MFI	CPHDI
№1 males	66,88***±3,37	41,90*±0,97	104,00±4,95	155,53**±1,85
№2 males	64,43±1,06	42,23****±0,36	103,98±1,98	161,20±1,19
№1 females	64,88***±1,14	46,15*±1,12	107,48±1,59	165,70**±0,86
№2 females	66,53±1,66	44,98****±1,57	107,73±5,59	157,45±6,33

(*P≥0,10, ** P≥0,01; ***P=0,40; ****P=0,20)

Dogs of group № 1 and females of group № 2 turned out to be the most high-bred dogs, males of group № 2 and females of group № 1 by this index have similar score.

Females, on average, have a longer muzzle, relative to the length of the head, than males in both study groups. In group № 1, this difference is more significant than in group № 2. In females in both groups, on average, muzzles are more full than in males. (P=0,40)

By the index of development of the cranial part of the head, females of group № 1 reliably have a relatively larger head in the cranial part than males. (P≥0.01)

It turns out that in females of group № 1 with a relatively shorter length (to height at the withers), the heads are more voluminous in the cranial part, full and with a longer muzzle, while they are less cheeky than in dogs of group № 1.

In females of group № 2 with a slight difference in relative length, the heads are more cheeky, the muzzle is more full and longer, and less voluminous in the cranial part than in males of group № 2.

It should be noted that during data collection, the dogs of both groups significantly differed in condition.

For dogs of group № 1, the working condition is characteristic due to the fact that most dogs of this group were in training at the time of the study. The muscles are well developed, subcutaneous fatty tissue is poorly developed, or absent.

For dogs of group № 2 the exhibition (factory) condition is most characteristic - subcutaneous fatty tissue is well developed, muscles are of average development and tone.

When determining the type of constitution, it should be noted that the dogs of group № 2 were characterized by some signs of looseness -

thicker eyelids, less fitting and rather heavy thick lips, a tendency to overweight compared to dogs of group № 1, where the strength and density of the constitution, adjacent eyelids, of moderate thickness of the lip were noted more often.

When assessing the type of wool, the length of the hair on the body and legs, tortuosity, and thickness of the coat were taken into account.

Giant Schnauzer is a wire-haired dog. FCI Breed Standard № 181 defines that “the coat must be wire-like, stiff and thick. It consists of a thick undercoat and not too short outer hair, which is tightly attached to the body. The outer hair should be stiff and of such a length that it is possible to check its structure by touch; it should be neither bristly nor curly. The hair on the extremities is less stiff. The hair on the head and ears is short. A harsh beard and thick bushy eyebrows almost hanging over the eyes are typical features of this breed.” [1]

In dogs of group № 1, the coat is more close to the standard. It is shorter, especially on the legs and along the bottom line, has a fracture and rigidity characteristic of the breed. Through the body, like a shell, it covers the body of the dog. This coat protects the dog well in adverse weather conditions and does not create problems in caring for the dog.

In dogs of group № 2, the coat is longer, especially long and thick on the limbs and along the bottom line (the so-called skirt), more prone to waviness, sometimes even slightly curly. The selection according to “elegance” led to the fact that the Giant Schnauzer with trimmed “columns” paws looks more impressive at exhibitions, therefore richly dressed dogs are much more successful at exhibitions. This poses great difficulties in grooming for the owner, since longer and thicker hair is prone to forming tangles in places of friction, often strips poorly and protects the dog worse from negative environmental factors, for example, it becomes more polluted and dries longer.

We do not exclude that the probable reason for the division of the Giant Schnauzer breed into exhibition and working breeding was, among all else, selection by the quality of the wool in the exhibition direction of breeding, because this factor is important in the success of the dog. In addition, a good groomer has great opportunities to correct shortcomings in a dog with a longer and thicker coat. This trait is a longer coat, often associated with a deviation from the desired type of constitution firmly dense towards firmly loose or firmly tender. And this complicates the use of the dog as an athletic (working) one, because the type of constitution is associated with the type of higher nervous activity.

Our study showed that dogs that successfully perform in sports complex training standards differ in constitution type from dogs that are successfully exhibited. Sports-working dogs have a tight-dense type of constitution, and show dogs are sturdy with elements of friability.

By to body indices, a significant difference was found in the index of massiveness and the index of development of the cranial part of the head in females and males of the group of sports-working dogs. We assume that if there were a greater number of successfully performing Giant Schnauzer dogs according to the comprehensive standards, the difference would be more significant.

Sexual dimorphism is more pronounced in dogs of the sports-working area of use, and in show dogs it is weakly expressed.

The condition of dogs directly depends on the direction of their use.

The type of coat differs significantly in dogs of a sports-working and exhibition use. The owner himself, purchasing a puppy for a specific direction of use, takes this factor into account. An excessively thick and long coat for an athletic working dog will be a hindrance to work, while the absence of a thick hair on the limbs will reduce the chances of winning in a high-ranking show ring.

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DEMOGRAPHIC AND HEALTH INDICATORS OF THE POPULATION OF KHANTY-MANSIYSK AUTONOMOUS OKRUG-YUGRA AT THE BEGINNING OF THE 3RD MILLENNIUM

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Abstract. The article discusses demographic and health indicators in the main oil region of the Russian Federation - the Khanty-Mansiysk Autonomous Okrug-Yugra at the beginning of the XXI century. Information is provided on the volume of oil production, on the population and demographic indicators, the share of economically active population employed in the extractive sector. Shows the general incidence of the population and the classes of the most common diseases. The effect of morbidity on life expectancy and premature mortality of the working-age population is noted.

Keywords: oil and gas sector, demography, health, morbidity, illness, mortality, life expectancy.

KMAO-Yugra is the main center of oil production in the Russian Federation. Its contribution to the extraction of this valuable raw material exceeds 40% of the total Russian production (Table 1). And although the share of oil produced nationwide is declining, for many decades this subject of the Russian Federation will remain the leading center of oil production in the country.

Table 1
Oil condensate gas production at KMAO-Yugra in 2001–2018

Year	Production volumes, mln tons	Share in Russian production, %
2001	194,2	55,8
2002	209,9	55,3
2003	233,2	55,3
2004	255,8	55,8
2005	268,0	57,0
2006	275,6	57,4

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Year	Production volumes, mln tons	Share in Russian production, %
2007	278,0	56,6
2008	277,6	56,8
2009	270,6	54,7
2010	266,0	52,7
2011	263,0	51,4
2012	259,9	50,2
2013	254,8	48,7
2014	250,3	47,8
2015	243,1	45,5
2016	239,2	43,7
2017	235,2	43,0
2018	236,1	42,5

Source: compiled by: [1].

The population of KMAO-Yugra lives in 13 urban districts and in 9 municipal districts. The population as of 01.01.2019 amounted to 1,663.8 thousand people, of which 92.4% are urban residents and 7.6% are rural residents. 51.3% of the district's residents are women and 48.7% are men. On average, there are 105.5 women per 100 men. From 2001 to 2018, the population increased by 20%, fertility - by 10%, mortality decreased by almost 12%, natural growth increased by 28.8% (Table 2). One fifth of the economically active population is employed in the oil industry (Table 3).

Table 2
Average demographic indicators in KMAO-Yugra in 2001-2018

Year	Population, thousand people	Fertility, ‰	Mortality, ‰	Natural growth, ‰
2001	1383,4	12,3	7,1	5,2
2002	1411,9	13,4	6,9	6,5
2003	1437,7	13,8	6,9	6,9
2004	1456,5	14,0	6,7	7,3
2005	1469,0	13,6	7,1	6,5
2006	1478,2	13,8	6,8	7,0
2007	1488,3	14,8	6,8	8,0
2008	1505,2	15,5	6,8	8,7
2009	1520,0	13,7	6,7	9,1
2010	1532,0	16,4	6,8	9,6
2011	1537,1	16,2	6,8	9,4

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Year	Population, thousand people	Fertility, ‰	Mortality, ‰	Natural growth, ‰
2012	1561,2	16,4	6,5	9,9
2013	1584,1	17,7	6,3	11,4
2014	1597,2	17,5	6,3	11,2
2015	1612,1	17,2	6,4	10,8
2016	1646,1	15,7	6,2	9,5
2017	1655,1	14,1	6,2	7,9
2018	1663,8	13,6	6,3	7,3

Source: [2-3]

Table 3
Employment of the population in the extraction of fuel and energy resources in 2001-2018

Year	Number of employed, total	Including in mining	
	thousand people	thousand people	share, %
2001	868,7	169,4	19,5
2002	878,0	164,3	18,7
2003	879,8	160,6	18,3
2004	873,5	152,7	17,5
2005	877,1	173,0	19,7
2006	879,4	187,2	21,3
2007	880,6	189,2	21,5
2008	901,9	188,6	20,9
2009	897,4	191,6	21,3
2010	897,6	194,6	21,7
2011	903,6	193,9	21,5
2012	912,2	197,5	21,7
2013	916,1	200,1	21,9
2014	917,2	203,9	22,3
2015	1037,4	214,3	20,7
2016	1025,4	218,6	21,3
2017	1077,9	228,8	21,2
2018	1085,7	232,6	21,4

Source: [2-3]

A significant impact on labor productivity is exerted by the general morbidity and mortality of the working-age population.

In the structure of the total morbidity for 2009-2018, respiratory diseases (42.9%) were in first place, external causes of death (injuries and

accidents, 11.5%) in the second, and diseases of the genitourinary system in the third (7.0 %). The structure of diseases is relatively stable, but it is also subject to fluctuations. So, over the same period, the largest increase in diseases was recorded in diseases of the respiratory system (15.9%) and the digestive system (18%). At the same time, the number of injuries and poisonings decreased by 10%, and the diseases of the musculoskeletal system by 20% (Table 3).

Diseases caused by certain illnesses lead to premature death of a person. In working age, this has a negative effect on the production process. Among the adult population, the majority of deaths are associated with diseases of the circulatory system (42.8%), in second place with external causes of death (injuries and accidents, 20.5%) and in third place with neoplasms (16.1%) (Table. 4).

At working age, the general causes of mortality are practically the same as among the adult population, but they differ slightly at the gender level. For example, in men and women in the first place are circulatory diseases, in the second - in men - external causes, in women - neoplasms. The third line in men is occupied by neoplasms, in women - by external causes. But it should be noted that more men die at this age than women by 3.7 times. By types of diseases, the scatter is more significant. So, from external causes, women die 5.3 times less than men, and 5 times less from blood diseases (Table 5).

Table 3

The total incidence of the population of the Khanty-Mansiysk Autonomous Okrug-YYugra by the most common types of diseases in 2009–2018 per 1,000 population, units

Name of individual diseases	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Average
General incidence	923,4	900,8	908,5	919,7	925,4	879,0	883,7	901,0	893,3	948,0	908,3
Respiratory diseases	394,0	379,1	394,6	387,1	302,8	385,5	407,1	411,6	411,9	456,6	393,0
Musculoskeletal system diseases	44,7	38,3	37,4	39,4	35,9	32,9	31,4	32,2	33,5	37,5	36,3
Genitourinary system diseases	58,0	66,8	64,9	73,9	68,5	66,3	58,6	61,3	60,4	54,8	63,4
Eye and its adnexa diseases	40,7	38,2	33,8	35,5	34,1	32,2	31,6	31,6	33,3	35,9	34,7
Diseases of the ear and mastoid process	25,1	27,3	26,3	25,4	25,3	23,6	22,4	22,2	22,0	23,4	24,3
Digestive system diseases	40,2	37,5	36,1	40,5	35,8	37,5	38,2	45,6	41,5	47,6	40,0
Circulatory system diseases	25,0	20,5	20,0	22,1	22,8	20,0	21,3	21,2	22,9	25,5	22,1

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Name of individual diseases	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Average
Diseases of the skin and subcutaneous tissue	48,7	52,0	53,6	56,7	56,3	51,0	50,6	51,5	51,5	54,8	52,7
Endocrine system diseases	13,6	10,5	10,6	14,8	14,4	14,1	15,5	17,3	17,2	14,6	14,3
Nervous system diseases	17,0	15,6	15,7	17,1	18,4	15,4	16,9	16,8	16,9	16,9	16,7
Infectious and parasitic diseases	47,6	48,7	45,4	42,0	45,4	40,5	36,1	32,6	36,5	38,1	41,3
Injury and poisoning	107,8	106,3	106,6	99,6	108,8	105,7	103,3	103,2	102,5	97,3	104,1
Neoplasms	12,4	11,2	11,4	11,5	12,4	12,7	11,1	12,0	12,4	12,0	11,9

Source: compiled by: [2-3].

Table 4
The distribution of the number of deaths in KMAO-Yugra for individual causes of death, per 10 000 population

Year	Dead	of them					
		from infectious and parasitic diseases	neoplasms	circulatory system diseases	respiratory diseases	digestive diseases	accidents, poisoning and injuries
2001	70,5	1,7	9,5	27,6	2,5	2,8	20,2
2002	69,0	1,6	10,0	28,2	2,6	2,6	17,8
2003	69,1	1,7	10,2	28,5	2,5	2,8	17,1
2004	67,2	1,7	9,9	28,6	2,1	2,8	16,1
2005	70,7	1,9	10,8	29,4	2,4	3,2	16,7
2006	67,9	2,0	10,6	29,0	2,4	3,2	15,1
2007	67,4	2,0	10,6	28,5	2,3	3,8	15,0
2008	67,5	2,2	11,4	29,6	3,0	3,5	13,2
2009	66,1	2,7	11,3	28,3	3,2	3,6	12,4
2010	68,4	2,4	11,1	30,2	2,9	3,7	12,3
2011	65,0	2,3	11,1	29,1	3,2	2,9	10,7
2012	60,9	2,1	11,3	28,7	2,7	6,1	10,0
2013	55,3	2,3	11,2	28,3	2,8	3,3	9,3
2014	64,3	3,7	11,1	26,3	2,7	3,8	9,6
2015	63,8	3,2	10,9	25,4	2,3	3,9	8,3
2016	62,2	2,9	10,9	25,4	2,3	4,0	7,7
2017	62,0	3,0	11,0	24,7	1,7	3,8	7,7
2018	62,6	2,9	12,2	24,7	2,0	3,7	7,1
Average	66,3	2,2	10,7	28,4	2,6	3,3	13,6

Source: compiled by: [2-3].

Table 5
Mortality rates of the working-age population in KMAO-Yugra by main classes of causes of death and sex, per 100,000 people of the corresponding age and gender in 2007-2018

Population	Both sexes	Men	Women
From all causes of death, of which:	456,9	707,0	187,2
– some infectious and parasitic diseases	35,9	51,2	19,3
– neoplasms	64,7	87,0	40,4
– circulatory system diseases	145,2	234,9	48,2
– respiratory diseases	16,8	26,6	6,4
– digestive diseases	32,2	45,1	18,1
– external causes of death	127,6	209,2	39,7

Source: compiled by: [4-6].

In diseases of the circulatory system, people most often died of coronary heart disease. Among the external causes of death in the first place is recorded death from accidents, in the second - as a result of road traffic accidents, and in the third - suicide. Malignant neoplasms often affect the digestive system and respiratory system.

The average age of the deceased in the main classes of diseases in 2007-2012 was 70.4 years, including men 61.6 years old; women 75.7 years old. The highest mortality is associated with some infectious and parasitic diseases - 47.5 years (men - 44.6 years, women - 50.3 years) and external causes (50.0, 45.5 and 54.6 years, respectively), and in diseases of the circulatory system, people die at a more advanced age. This is characteristic of both men and women (Table 6). In all age groups, mortality in men is higher than in women. So, at the age of 60-64 years, mortality among men is 2.2 times higher than among women.

Table 6
The average age of the dead in KMAO-Yugra according to the main classes of causes of death in 2007-2012, years

Population	Both sexes	Men	Women
From all causes of death, of which:	70,4	61,6	75,7
– some infectious and parasitic diseases	47,5	44,6	50,3
– neoplasms	69,8	65,7	71,5
– circulatory system diseases	75,6	66,0	79,3
– respiratory diseases	68,9	61,4	73,5
– digestive diseases	65,6	60,6	69,2
– external causes of death	50,0	45,5	54,6

Source: compiled by: [4-5].

The decrease in the incidence of the population has a beneficial effect on life expectancy - it is growing. According to the Department of the Federal State Statistics Service for the Tyumen Oblast, KMAO-Yugra and YaNAO, the average life expectancy in 2018 was 74.3 years, including 69.9 years for men and 78.4 years for women [2-3]. Since 2001, total life expectancy has increased by 8.1 years, including by 9 years for men and 6 years for women. The increase in life expectancy is due to several reasons, the main of which is the improvement of medical services for the population, the introduction of medical examinations and the involvement of more and more people in this process, the promotion of a healthy lifestyle, the improvement of social services, etc.

Nevertheless, the achieved indicators of average life expectancy are inferior to many countries of the world, primarily the states of Europe, most of the countries of Asia and Latin America. According to the UN [7], the average life expectancy in these regions is about 75 years, while in women it has surpassed the mark of 80 years. How many years a person can actually live, there is still no definite answer to this question. In scientific and near scientific literature, in periodicals one can often find a figure that the age limit of human life is limited to 120-140 years. If this is the case, then the residents of KMAO-Yugra and not only they have an age limit to which they should strive.

Conclusions

1. At the beginning of the XXI century, KMAO-Yugra recorded a positive natural population growth. Fertility exceeds mortality by 2.1 times. The highest birth rate was in 2013 and amounted to 17.7 ‰, the lowest mortality rate in 2016-2017 - at 6.2 ‰. The difference between the highest birth rate and the lowest mortality rate was 2.85 to 1. The natural population growth in all years was positive.

2. In the Autonomous Okrug as a whole, there is a slight decrease in the incidence, including for most types of diseases. Over the 10 years from 2009 to 2018, the overall incidence decreased by 1.6%. The most noticeable decrease in the incidence of eyes (17.3%) and musculoskeletal system (23%). At the same time, the incidence of the endocrine system (5.1%), skin and subcutaneous tissue (8.2%), and the genitourinary system (9.3%) increased.

3. Of the total number of diseases, almost 62% are accounted for by 3 types of diseases - diseases of the genitourinary system, trauma and poisoning, and respiratory diseases. The average age of the deceased in the main classes of diseases exceeded 70 years.

4. Despite the high incidence of the population, the life expectancy of the population is increasing in the Autonomous Okrug. Since the beginning of the 3rd millennium, it has grown by more than 8 years, including 9.5 years for men and 6 years for women.

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ANALYSIS OF THE EFFICIENCY OF THE USE OF MATERIAL AND ENERGY RESOURCES OF CHEMICAL PRODUCTION

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Abstract. The article provides an analytical apparatus for assessing the effectiveness of energy and resource conservation in chemical production. An exergy method for calculating the degree of perfection of the energy exchange process of a substance is considered. An algorithm is proposed to increase energy efficiency based on process optimization and identification of internal energy resources.

Keywords: energy saving, exergy, exergy efficiency, process irreversibility, target product, internal exergy loss).

The main tasks that must be solved when analyzing the energy efficiency in chemical production are as follows:

- 1) generalized assessment of material and energy resources based on classical thermodynamics;
- 2) analysis of the efficiency of energy and substance consumption in nonequilibrium processes;
- 3) search for ways to increase efficiency, i.e. development of general principles for the optimal use of material and energy resources;
- 4) applied part, i.e. assessment of technological aspects.

Imagine a functional diagram of an energy-chemical-technological system (ECTS).

Assessment of the effectiveness of the use of a substance is based on the law of conservation of matter. Below we present the mass balance equation for a real process.

$$\sum_{i=1}^n v_i M_i = \sum_{j=1 \neq a}^m v_j M_j + \sum_{j=1}^a v_j M_j = \sum_{j=1}^m v_j M_j \quad (1)$$

$\sum_{i=1}^n v_i M_i$ – total flow of incoming substances, among which are the main components and auxiliary (for example, catalysts);

$\sum_{j=1}^m v_j M_j$ – total flow of outgoing substances, among which:

$\sum_{j=1}^a v_j M_j$ – target products;

$\sum_{j=1 \rightarrow a}^m v_j M_j$ – by-products (intermediates, waste).

In the chemical industry there are solid waste, gas emissions, liquid effluents. Processing (crushing, filtering, settling) consumes a significant amount of energy, but the cost is justified by a guarantee of safety (lack of toxicity). Waste can be negligible, and its harmfulness, i.e. toxicity is very high. This circumstance is taken into account by additional indicators, i.e. indicators directly focused on prices.

The value of the mass utilization factor η_M is used to estimate the actual cost of the target product (2):

$$\eta_M = 1 - \frac{\sum_{j=a+1}^m v_j M_j}{\sum_{i=1}^n v_i M_i} \quad (2)$$

Energy consumption is estimated by energy utilization factor η_E (3):

$$\eta_E = \frac{\sum_{j=1}^a v_j \tilde{H}_j + \dot{Q}_k(\bar{T}_k) + \dot{w}}{\sum_{i=1}^n v_i \tilde{H}_i + \dot{Q}_k(T_k > T_c) - \dot{w}} \quad (3)$$

Equation (3) is obtained on the basis of the total energy balance equation (4):

$$\sum_{i=1}^n v_i \tilde{H}_i - \sum_{j=1}^m v_j \tilde{H}_j + \Sigma \dot{Q}_k(\bar{T}_k) - \dot{w}^E = 0 \quad (4)$$

$\sum_{j=1}^m v_j \tilde{H}_j$ – resulting convective flows of enthalpy;

We do not take into account the kinetic and potential (gravitational) energies.

When it comes to specific processes in devices of a given design, these types of energy will be taken into account. For example, an inkjet apparatus.

$\Sigma \dot{Q}_k(\bar{T}_k)$ – convective heat fluxes that have their potential;

$-\dot{w}^E$ – total flow of electricity that is supplied to the ECTS.

We do not take into account mass transfer processes occurring on a control surface with the environment, since they usually occur within the system itself.

In general, energy consumption is estimated by the ratio (5):

$$\eta_E \cong 1 - \frac{\dot{E}_{av}^{noT}}{\dot{E}'} = \frac{\text{losses into environment}}{\text{energy input}} \quad (5)$$

\dot{E}^{noT} – heat loss into the environment due to poor thermal insulation, which go along with waste (gas emissions) \dot{E}' – flows that are fed.

Energy efficiency assessment, i.e. a qualitative indicator of energy consumption is done using the Gibbs component of energy, i.e. exergy.

Then, in general terms, the exergy balance equation is as follows (6):

$$\dot{E}'_x = \dot{E}''_{x\text{ target}} + ex\dot{D} + in\dot{D} \quad (6)$$

1) \dot{E}'_x – incoming exergy streams;

$\dot{E}''_{x\text{ target}}$ - target exergy flows;

2) $ex\dot{D}$ – losses that go into the environment are caused by full energy (imperfection of thermal insulation, i.e. these losses are caused by waste), with which they take place;

3) $in\dot{D}$ – internal losses that are caused by $in\dot{S}_{12}$ (a stream of entropy originating within the process itself).

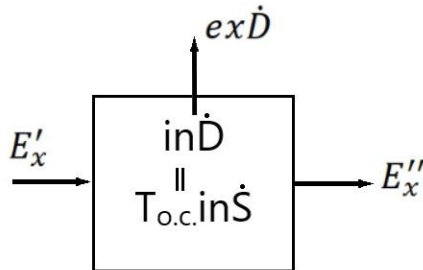


Fig. 1. Functional diagram of a real energy converter

We introduce the concept of exergy efficiency η_{ex} , i.e. target efficiency by the Gibbs energy indicator(7):

$$\eta_{ex} = \frac{\text{target}}{\text{use}} = \frac{\dot{E}''_{x\text{ target}}}{\dot{E}'_{x\text{ use}}} = 1 - \frac{ex\dot{D} + in\dot{D}}{\dot{E}'_{x\text{ use}}} \quad (7)$$

The process should be divided into stages, since it is important to obtain both overall efficiency and efficiency for each individual stage, so that these values can be analyzed (8).

$$\eta_{ex\text{ entire inst.}} = 1 - \frac{\sum_{i=1}^f \dot{D}_{i\text{ entire inst.}}}{\dot{E}'_{x\text{ entire inst.}}} \quad (8),$$

where according to the Guy-Stodola formula $in\dot{D} = T_{o.c.} in\dot{S}_{12}$

$$\frac{\dot{D}_i}{\dot{E}_{x \text{ inst.}}} = \frac{\dot{D}_i \cdot \dot{E}'_{x_i}}{\dot{E}'_{x \text{ inst.}} \cdot \dot{E}'_{x_i}} = (1 - \eta_{\text{ex}_i}) \cdot d_i, \text{ where}$$

1) $a_i = \frac{\dot{E}'_{x_i}}{\dot{E}_x} = d_i$ – fraction of exergy introduced into the i -th stage of the total exergy stream introduced into the entire installation as a whole.

$$d_i = \frac{\dot{E}'_{x_i}}{\dot{E}_x}$$

2) $\frac{\dot{D}_i}{\dot{E}'_{x_i}} = (1 - \eta_{\text{ex}_i})$, where η_{ex_i} - exergy efficiency of the i -th stage

So, we will analyze in comparison with the previously obtained formula:

$$\eta_{\text{ex inst.}} = 1 - \frac{\sum_{i=1}^f \dot{D}_i}{\dot{E}'_{x \text{ inst.}}} = 1 - \sum_{i=1}^f (1 - \eta_{\text{ex}_i}) d_i$$

$\dot{D}_{\text{inst.}} = \sum_{i=1}^f \dot{D}_i$ = losses of the entire installation are generally equal to the sum of losses in all stages (there are $i=1 \dots f$ of them).

We presented the formula for dividing the installation in space, and maybe separation in stages, i.e. different processes taking place in one space. There are also variable parameters (e.g. reflux ratio). If there are many such parameters, then multi-parameter optimization is carried out.

External losses of exergy $\text{ex}\dot{D}$ - are caused by losses of matter and energy into the environment (imperfection of thermal insulation, waste, effluents, emissions). For the final choice of the technology mode, the economic side of the problem, environmental indicators and hardware design are taken into account. Technosphere security is a unifying problem for all civilized countries and concerns the minds of both world-famous scientists and us, ordinary young scientists.

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**RESEARCH OF SEED DAMAGING PROCESSES IN COMBINE
HARVESTING OF SOY**

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Abstract. Theoretical issues of jamming and destruction of soybean grain in milling and transporting devices of a combine are considered.

Keywords: soy, harvesting, combine, threshing and transporting devices

Soybean during processing undergoes a variety of mechanical effects from threshing and conveying devices. Two of the most common can be distinguished among them - compression during pinching and free and non-free collision of grain with the working surface. When exposed to working bodies, soybean grain will not be destroyed if its strength characteristics turn out to be higher than those force effects that arise between them as a result of force contact during threshing and transportation.

Damage to grain during its transportation depends on: factors associated with the biological and physico-mechanical properties of grain that determine its strength (moisture, size, weight, culture, temperature, shape, grain structure), operating modes of threshing and conveying devices and their design.

Consequently, the issues of reducing damage to soybean grain during harvesting and underworking should be considered comprehensively, taking into account the physicomachanical properties of plants and grain (size, shape, structure and chemical composition), technological gaps, and the modes under which threshing and transportation are carried out.

Under loadings, soybean grain is interpreted by an elastic - plastic body due to the peculiarities of its structure and chemical composition. As a result of its compression during pinching, as well as when it collides with the working bodies or vice versa, elastic and plastic deformations arise in the contacting bodies. These deformations can be either only in the vicinity of the contact area of bodies (local deformations), or at a considerable distance from them (general deformations).

According to the empirical law, elastic deformations in the grain during dynamic loading develop independently of plastic, and therefore the main force develops upon contact due to elastic deformation.

Due to the complexity of describing the dynamic state of soybean grain during its movement in threshing and conveying devices and obtaining a mathematical model of the damage process, the following assumptions must be taken into account: (soybean grain is uniform throughout the volume; the friction force of the soybean grain with the interaction surface is assumed to be proportional to its normal pressure; displacements are considered in steady-state mode and aerodynamic drags are not taken into account; the angle of deviation of the absolute speed from the normal is equal for all grains, and it may relate to both the shell and the working body).

The total impact force causing deformation is determined by the formula

$$P = P_{\text{elast}} + P_{\text{plast}}, \quad (1)$$

where P_{elast} , P_{plast} – elastic and plastic components of impact force.

Since the plastic component of the impact force in magnitude is 5-7% of the total impact force, therefore, in the theoretical analysis, only the elastic component of the impact force is taken into account, taking it for the total force when loading the grain.

The jamming condition of soybean grain in the screw can be expressed as:

$$D_c \leq D_s \pm C + \mathcal{B}_c \quad (2)$$

where $\pm C$ - screw deviation under vibration;

D_c - screw casing diameter; D_s - screw diameter;

\mathcal{B}_c - soybean grain thickness.

Under the influence of the edge of the screw due to the friction force and the force of its own weight, the grain, in contact with the screw, receives an impulse of rotational-translational motion. As a result, it is pinched over the casing from the position of the thickness to the position of its width or length, but, remaining in the gap of a certain size equal to the thickness of the grain. With such a complex rotational-translational

motion, soybeans, being in a constant gap between the screw and the casing, are compressed from the size of its width or length to the size of its thickness. Variation curves of the dimensional characteristics of soybeans (varieties October 70) show that soybeans have dimensions in length from 5.8 to 7.2 mm, in width from 5.4 to 6.8 mm and in thickness from 4.6 to 6 mm. If it gets into the gap between the screw and the casing $Z=5$ mm, it will be compressed $\Delta B=0.8-1$ mm in its width and $C=1.2-1.4$ mm in length. And since the elastic modulus of soy is much less than the screw, the screw, when rolling with it through the casing, will crash into its shell and the cotyledons under it to a depth of 0.8-1.4 mm or flatten it by $\Delta l = 0,8-1$ mm.

When compressed with the rolling of soybean grain in the screw, it will experience pressure from the screw and the casing.

Solving the system of equations for $\frac{\alpha\varphi}{\alpha t} = const \frac{d^2\varphi}{dt^2} = 0$, $m = 1$, $G=mg=g$, determine the forces of normal pressure on soybean grain from the side of the screw surface and the casing

$$N_s \cos \alpha - f_s N_{ss} \sin \alpha - f_c N_{cs} \sin \gamma - g \cos \theta = 0 \quad (3)$$

$$G \sin \theta \sin \nu + f_c N_{cc} \sin \beta - f_s N_{sc} \cos \alpha - N_{sc} \cos \alpha - N_{ss} \sin \alpha = 0 \quad (4)$$

Pressure from the Screw:

$$N_B = \frac{g \sin \theta \sin \nu \sin \gamma - g \cos \theta \cos \gamma}{f_1 \sin_1(\alpha + \beta) - \cos(\alpha + \gamma)} \quad (5)$$

Pressure from the casing:

$$N_K = \frac{(g \sin \theta \sin \nu \sin \gamma - g \cos \theta \cos \gamma) \cdot (\cos \alpha - f_s \sin \alpha) g \cos \theta}{f_k \sin \gamma [f_s \sin(\alpha + \gamma) - \cos(\alpha + \gamma)]} \quad (6)$$

When the soybean grain is pinched between the screw and the casing in a moving screw, the resulting pressure on the soybean grain from the screw side, according to the theory of contact stresses, exceeds the grain elasticity by about 50 times or more, therefore, the soybean grain is intensively destroyed.

The condition of pinching soybean grain in a screw conveyor can be considered using Fig. 1. If for a moment the grain in a pinched state is motionless in the gap relative to the screw and the casing, the sum of the projections of the forces acting on the grain on the axis OX, OU, OZ should be equal to zero:

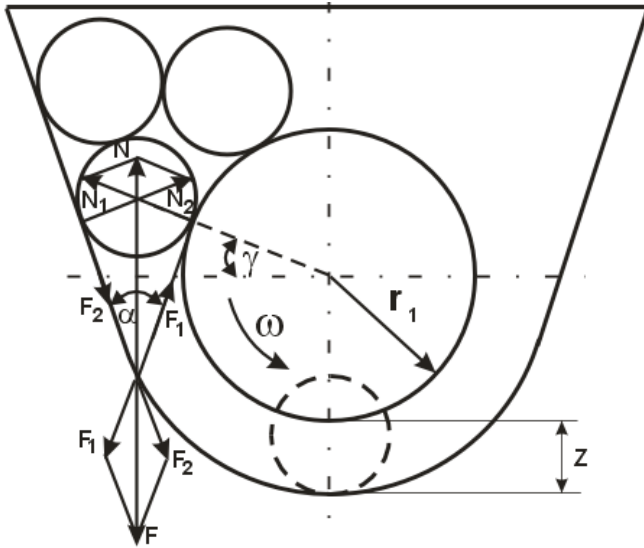


Fig. 1. Forces acting on soybean grain in a screw conveyor

$$\begin{aligned}
 Px &= N_1 + N_2 \cos \gamma + F_2 \sin \gamma = 0 \\
 Py &= F_1 + F_2 \cos \gamma - N_2 \sin \gamma = 0, \\
 Pz &= N_2 - mV_{\text{окр}}^2 r
 \end{aligned}
 \tag{7}$$

where: N_1, N_2 – resulting for normal forces;

$F_1 = f_1 \cdot N_1, F_2 = f_2 N_2$ - resulting for frictional forces;

f_1, f_2 - actual friction coefficients at the contact points.

Substituting into the equality the value of the friction forces, multiplying both parts and subtracting term by term, we obtain:

$$N_2 f_1 (\cos \gamma + f_2 \sin \gamma) - N_2 (\sin \gamma - f_2 \cos \gamma) = 0 \tag{8}$$

Having reduced N_2 and dividing by $\cos \gamma$ after some transformations, we finally get:

$$\operatorname{tg} \gamma = \frac{f_1 + f_2}{1 - f_1 f_2} \tag{9}$$

Equality (2.60) relates the pinch angle to the coefficient of friction in the pinch state. It shows that the natural tightening of the grain will be carried out when

$$g \geq f_1 + f_2 \quad (10)$$

where $\gamma = f_1 + f_2$ grain slipping out and no pinching and breaking.

Theoretical analysis allows us to establish the condition of pinching, compression and destruction of grain. The working bodies of the combine do not equally exert a force on the grain in the process of breaking its connection with the leaflets of beans and damage it (Table 1).

Analyzing the work on damage to soybean seeds, the working bodies are divided into two groups according to the power activity of the impact:

- a) working bodies that carry out the selection of grain from a straw heap;
- b) working bodies for the separation of grain from the grain heap and its transportation.

Table 1
Damage to soybean seeds by the working bodies of the combine

№	Name of working bodies	Grain damage, %	
		to ground grain	growing damage
1	Tilt camera	0,53	0,53
2	First drum	5,56	6,09
3	Intermediate beater	0,61	6,7
4	Second drum	2,89	9,59
5	Bumper beater	0,49	10,08
6	Straw walker	0,07	10,15
7	Cleaning	0,24	10,39
8	Grain auger	2,19	12,58
9	Grain elevator	1,85	14,43
10	Spike auger	1,23	15,66
11	Wheat elevator	1,09	16,75
12	Small grain auger	0,85	17,6
Total			17,6

Studying this, using the example of the table, we can assume that the first group accounts for more than 59% of the damaged grain to the total amount of damaged grain. That is, by the number of damaged grain, the group of nodes of the combine of the threshing and separating device is in the first place, and this implies that its constructive and technological re-evaluation is an urgent task. An equally important task is the creation of transporting devices that act on the grain when moving with an effort not exceeding the strength of the grain itself.

From the above, it follows that the desire to reduce grain damage in various ways when harvesting soy does not lead to a solution to the problem of obtaining high-quality seeds, since their biological diversity was not taken into account. Therefore, the problem of reducing mechanical damage to grain should be solved inextricably with the problem of isolating biologically complete soybean seeds during threshing.

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THE INFLUENCE OF DRIVER EXPERIENCE ON TRAFFIC SAFETY

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Abstract. This article is aimed at the need to improve driver training to increase their reliability, which will significantly reduce the level of road accidents. The authors propose to consider the concept of driver reliability, personal qualities of drivers and their reaction time.

Keywords: transport, traffic, driving, driver training, safe driving.

Today it is impossible to imagine human life without transport, as it is an integral part in everyday life. It is quite difficult to imagine at least one day without public or personal transportation. Road transport is considered one of the most dangerous kinds of transport, it refers to high-risk vehicles. According to statistics, the most unpredictable road user is a driver of a motor vehicle. Road accident in Russia is an urgent problem. Every day people die and get injured on the roads. Russia takes the leading place in the number of road traffic accidents (RTA) among other countries. Every year in the world there are about 55 million RTA, in which more than 1.2 million people die and another 20 ... 50 million are injured. Accident rates are reduced due to measures that increase road safety. In turn, the professional skills of the driver have a significant impact on the state of the road safety.

There is such a thing as driver reliability, that is, the ability to accurately control a vehicle in any road conditions and throughout the entire working time. The main factors determining driver reliability are professional suitability, preparedness and high working capacity. The professional suitability of the driver depends on and is determined by the state of health, psychological and personal qualities.

Process Management and Scientific Developments

Considering that a driver's mistake can threaten the health and life of both the driver and other people, the requirements for his performance should be quite high. Professional reliability of the driver consists of: preparedness, performance, suitability, emotional stability. The driver's safe driving is influenced by many factors, as shown in Figure 1.

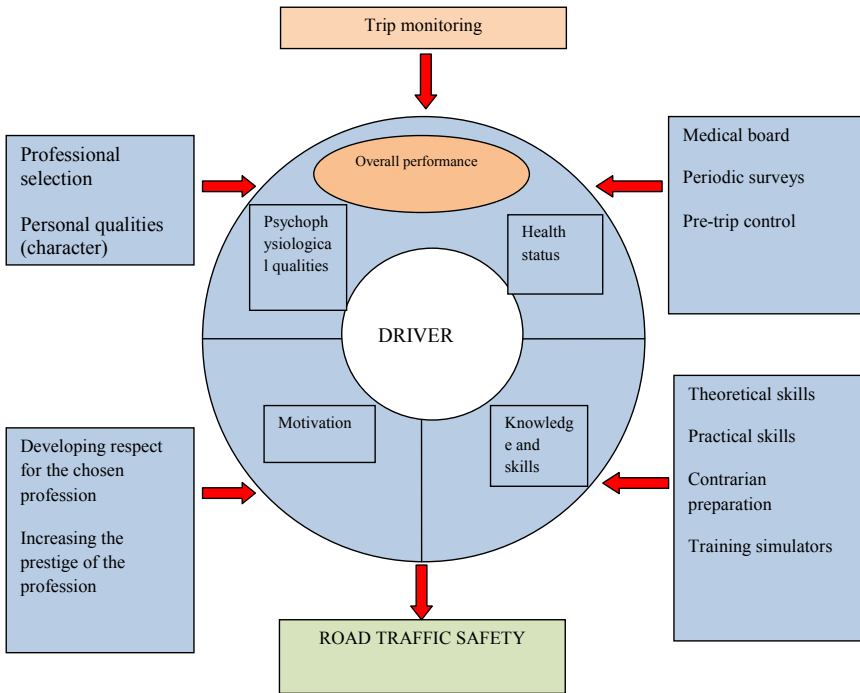


Figure 1 - Factors Affecting Safe Driving

The preparedness of the driver is usually determined by the level of his professional knowledge and skills acquired in the process of training and subsequent professional activities. A good driver training is expressed in the presence of a wide range of skills, brought to the level of automatism of actions, ensuring the correct and timely action in unusual traffic situations. To a greater extent, excellent driver training allows you to use all the technical capabilities of the car, as well as accurately, with a minimum expenditure of energy, to control it; makes it possible to timely and correctly

assess possible changes in the road situation, to prevent the occurrence of emergency situations; drive in difficult road conditions without making any mistakes. Professionalism is determined by an equally important factor, such as the level of psychological preparedness of the driver, that is, the presence of his psychophysiological properties to ensure reliable operation in any conditions.

Under normal operating conditions and good health conditions, the response time of the driver is in the range of 0.8 s up to 1.0 s. The reaction time increases with the occurrence of driver fatigue, various extraneous stimuli, the prevalence of negative emotions, as well as with an improperly constructed daily regimen. With the accumulated driving experience, a high level of professionalism of the driver, the reaction time is reduced. Table 1 shows the characteristics of drivers depending on their category.

Table 1 - Characteristics of drivers depending on the category

Driver category	Properties of the nervous system
A	A person with a strong nervous system, balanced, well adapted to the environment in which all the processes of excitation and inhibition are in balance
B	A person with a strong nervous system, balanced, who does not adapt well to the environment, in the nervous system, inhibition prevails over excitation
C	A person with a weak nervous system, impatient and sensitive, in which, depending on the circumstances, either excitation or inhibition may prevail. Not quite suitable for the driver profession

The response time of the driver can be classified into two periods:

- 1) latent (hidden), measured by the time from the moment of danger to the beginning of movement;
- 2) motor, measured by the time of movement.

During the latent period, the occurrence of processes that are directly related to sensation and perception, as well as the assessment and prediction of the situation and the development of the optimal solution, is observed. For a simple reaction to light, the duration of this period is 0.2 s, and the reaction to sound is 0.14 s. The latent period depends on the individual psychophysiological characteristics of the driver, his condition and experience, as well as on the nature of the traffic situation.

In particular, the time of the motor period depends on the complexity of the action, the age of the driver, as well as the degree of surprise of

the signal. The average time of the motor period to the red signal of the driver at the age of 18–22 years is 0.48–0.56 s, at the age of 45–60 years - 0.78–1.96 s with simple reactions, with a complex reaction, respectively 1, 05–1.96 s and 1.59–2.61 s. It is much more difficult for the driver to implement actions to prevent RTA during longer reaction times. The reaction time of drivers may vary 3-4 times.

With a high traffic flow and a significant number of objects falling into the driver's field of vision, it becomes much more difficult for them to evaluate a certain signal and, therefore, make the right decision. If the carriageway consists of two or three lanes for traffic in both directions, then the shortest reaction time corresponds to an intensity of 120-200 auth / h, and the longest - when driving on a road free of vehicles. This street-road network is characterized by monotony, which reduces the driver's attention and emotional stress. When driving along straight sections of the road without turns, ups and downs, due to monotony, the driver's ability to perceive the situation deteriorates, and the duration of signal detection increases.

To increase the level of driver training, the following recommendations should be followed:

- 1) increase hours of practical training;
- 2) tighten the medical examination of candidates for drivers;
- 3) conduct testing upon admission to a driving school for psychological stability;
- 4) continuously improve the level of training of instructors..

Thus, the professional reliability of the driver is characterized by many parameters and indicators. The driver has a special place in the VADS system and is directly related to its reliability. The number of drivers in recent years has increased significantly, which led to a significant increase in novice drivers who do not have experience and skills in driving vehicles. That is why an experienced driver who drives a vehicle must be prepared for various situations on the road and prevent emergencies in a timely manner.

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CURRENT PROBLEMS IN THE DEVELOPMENT OF MINERAL DEPOSITS

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Annotation. The article discusses the causes of rock movement and deformation of the earth's surface during the development of mineral deposits. Methods of carrying out observations of deformations, instrumental control of the earth's surface for buildings and structures that are located directly on the mined area are given. Based on the analysis, it was found that traditional methods of geodetic measurements in comparison with modern methods have a number of disadvantages, but they should not be neglected and therefore there is a need for comprehensive monitoring of the earth's surface movement. Ensuring the stability of the sides and slopes of the ledges of quarries with the help of modern innovative methods and the organization of an integrated approach for research and monitoring.

Keywords: displacement of the earth's surface, deformation, profile lines, subsidence, mulda displacement, stability, slope of the ledge.

Currently, the mining industry is the basis of the economy of any state and, accordingly, mining forms a significant part of income. Intensive development of mineral deposits entails a violation of the natural state of the rock mass, which in turn leads to changes in stability and the occurrence of deformations of the earth's surface. During the entire period of development of mineral deposits, the issues of stability of sides and slopes of ledges of quarries, displacement and deformation of the earth's surface remain one of the most important aspects.

During the development and operation of mineral deposits, there is a need for regular research and observation of the state of various objects of the mining industry. The study is carried out in the framework of geodynamic and geomechanical monitoring on deposits based on the extraction of solid minerals [1].

One of the most pressing problems in the development of mineral deposits is the forecasting and control of the process of shifting the rock mass and the earth's surface. The method of geodynamic monitoring is the geodesic method. Geodetic monitoring allows for high accuracy to perform a quantitative assessment of the characteristics of the parameters of the earth's surface movements, the stress-strain state of the surface layer in the areas under development. Depending on the increase in the area of the developed space, the deflection of rocks also increases, a larger number of layers are involved in the process of shifting, as a result of which there is a shift of rocks along the planes of stratification, secant cracks and stratification cracks appear in the thickness, while the layers of the immediate roof are usually broken into separate blocks and collapse [2].

When conducting geodynamic monitoring of the process of shifting the earth's surface during the development of deposits, deformations in the vertical and horizontal planes are determined. In the course of geodetic monitoring is the determination of the coordinates of points of basic surveying-geodetic network of reference points and observation stations using modern complex of satellite geodesy, define the parameters of geodynamic movements, which are due to the formation of the mold displacement. As a result of monitoring the geodynamic activity of the territory, the vectors of spatial shifts of the reference points of the observation station are determined. Observations of the earth's surface displacement are carried out to determine the parameters of the process of displacement in the field and to obtain actual data for the reasonable solution of issues of protection of structures and extraction of ore from safety pillars.

On the basis of the obtained results, graphs of tensile-compression deformations and shear deformations are constructed and the nature of the deformations is established. Each profile line should consist of reference and working reference points. Reference reference points are laid at the ends of the profile lines outside the zone of displacement of the earth's surface. The number of them at each end of the profile line must be at least two. Working reference points are laid within the expected zone of displacement of the earth's surface. In the future, based on the profile lines in accordance with the approved in the project frequency are instrumental observations, the results of which you can draw conclusions about the magnitudes of the deformations of the earth's surface [3].

Near the Karaganda coal basin, entire residential areas are affected by mining developments. So 2-storeyed buildings on Lenin street are strengthened since 1980 by metal couplings (figure 1).



Figure 1 - buildings on Lenin street with reinforced metal ties

As a result of subsidence of the under-worked territories on a large area of the district the mulda in which in spring time water accumulates was formed. On the territory of mulda sedimentation garages are located, which are subject to constant destruction due to subsidence of the earth's surface. A section of the M36 highway, which provides the most important interstate transport links, falls into this subsidence pool (figure 2).



Figure 2 - Destruction of garages and the M36 highway near the mined areas

Figure 3 shows the final result of processing a 28-pass chain of radar images of the selected area of interest.

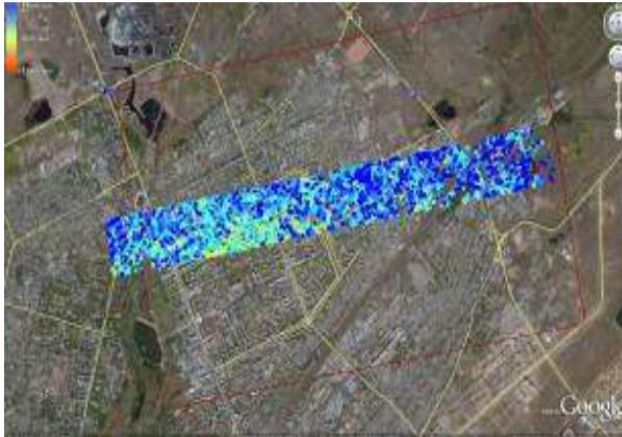


Figure 3 - General view of the received processing results

As a result of processing, strong deformations were revealed in the area of garages on Tereshkova street. Subsidence of the earth's surface is more than 20 mm per year (figure 4).

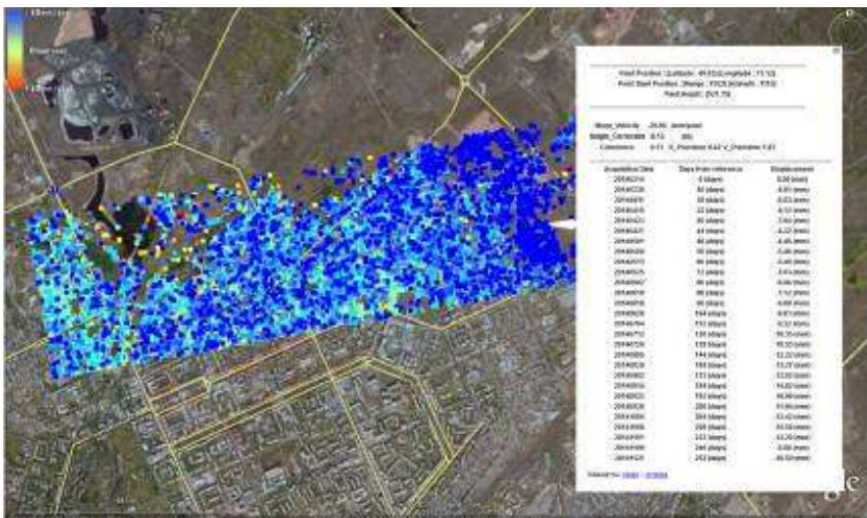


Figure 4 - results of satellite monitoring of the territory of garages on Tereshkova street

In the course of the work, a graph of subsidence of this territory was obtained, which allows to graphically observe the processes of deformation of structures (figure 5).

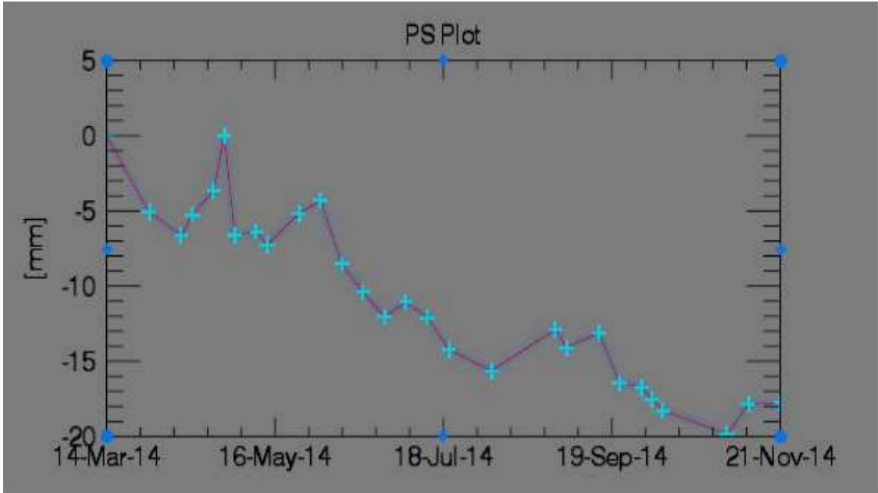


Figure 5 - Graph on the points of deformation of garages on Tereshkova street

Close proximity to the mine entails great consequences, since the buildings located on Tereshkova street are subject to deformation, which is clearly visible on the deformation graph (figure 6). Deformations are up to 18 mm per year.

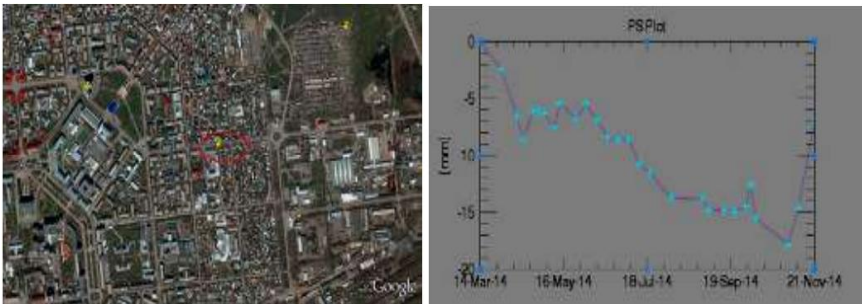


Figure 6 - A graph of deformations of one of the buildings on Tereshkova street and its geographical position in GoogleEarth

In the area of the cultivated area there is a building of 16-storey residential complex. High-rise buildings are given special attention. The results of processing showed that this object is in a stable state (figure 7). Deformations ranged from + 0.5 to -2 mm during the reporting period [4].

According to the results of the study, it can be concluded that during the processing of satellite images, deformations of buildings and structures on Tereshkova street (more than 20 mm) were detected. The territory of Lenin street, according to the results of processing, is less susceptible to changes (on average, deformations ranged from -4 to +5 mm during the reporting period). The high-rise building of the 16-storey residential complex is also in stable condition (from -2 to + 0.5 mm per year).

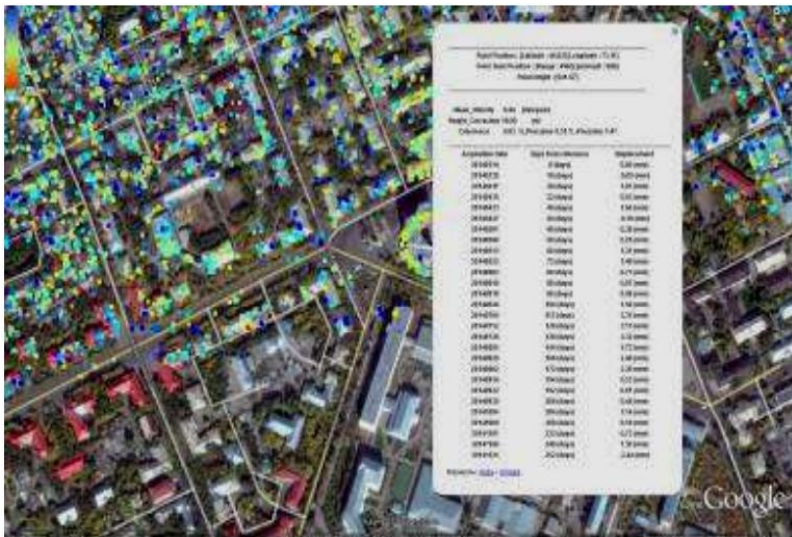


Figure 7 - results of satellite monitoring of a 16-storey residential building using PSI technology

Graphic visualization of deformation points is shown in figure 8.

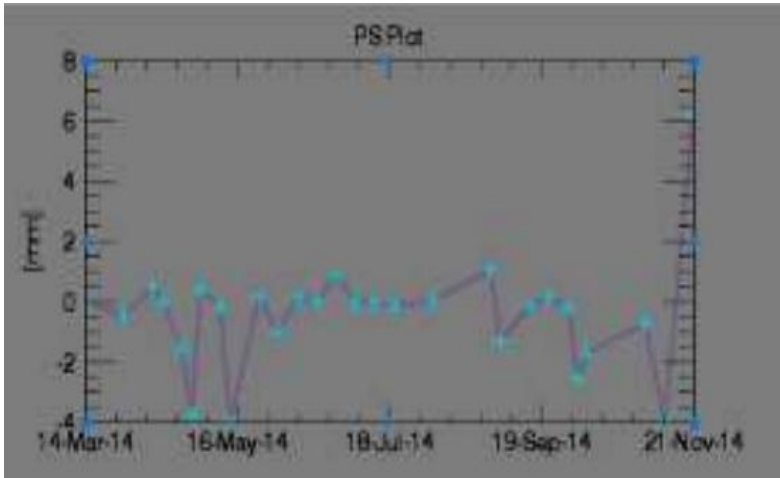


Figure 8 - Graph of deformation points of a 16-storey residential building

Then Lenin street was considered. This area as a whole is in a stable state, which is shown on the graph of deformations (figure 9).

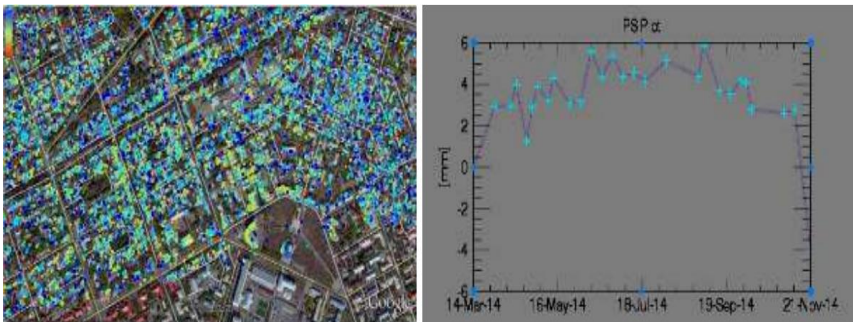


Figure 9 - results of processing of Lenin street territory imported to Google Earth and deformation graph

The importance of sustainability in modern mining industry, is characterized by the growth capacity of enterprises, intensification of production processes, increasing depth and timing service workings particular importance to the problem of acquired sustainability of pit slope, from the successful solution of which depends largely on the efficiency and safety of mining operations, as well as the completeness of extraction of minerals from the subsoil.

The solution to this problem is the development of theoretical foundations, methods and means to ensure long-term stability of quarry slopes at the maximum possible angles, which will make it possible to conduct effective and safe mining of solid mineral deposits in the open way [5].

The stability of the sides of the quarries is determined by the parameters of the angles of the ledges, calculated by special methods that use the strength and deformation characteristics of the rock mass. The research methodology for solving the problem of long-term stability of quarry slopes at the maximum possible angles is based on a comprehensive approach that includes: analysis and generalization of achievements of science, technology and practice of ensuring long-term stability of quarry slopes at mining and coal enterprises of the country and abroad; methods of field observations, geological, geophysical, surveying surveys and measurements in the study of structural and tectonic features of rock masses, assessing the degree of their disturbance, identification of the nature and establishment of patterns of deformation of rock masses, including under the influence of mass explosions; methods of field and laboratory tests for determining the physical and mechanical properties of rocks in samples and array; analytical, graph-analytical, graphical and numerical methods for substantiating geomechanical models and solving problems of stability of slopes in structurally disturbed arrays [6].

Currently, the determination of the parameters of the process of displacement, ensuring the stability of the sides and slopes of the ledges of quarries are performed according to common requirements and methods based on the experience of the most studied fields. Based on the accumulated experience in the field of monitoring the geomechanical state of the rock thickness and the earth's surface, there is a need to predict the process of displacement, to develop a set of methods, technical means, methods and engineering methods of calculation that allow to obtain reliable data on the structure, properties and condition of rock masses, to determine the rational parameters of structural elements of stationary sides of ore quarries and to ensure their long-term stability at the maximum possible angles. The development of complex of measures on prevention of emergency situations in the conduct of mining operations.

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ANALYSIS OF COMPLEX CORROSION PROTECTION OF SHIP AND VESSEL'S HULLS

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Abstract. Corrosion of steel hulls of ships and vessels is the main cause of vessel wear, reducing the strength of hull structures and safety of navigation. To ensure the protection of the housings against corrosion, to achieve the required level of reduction or to prevent corrosion, an integrated approach is necessary. This approach should be based on the rational use of various methods of protection and control, taking into account the structural features of the hulls and the conditions of technical operation of ships and vessels.

Keywords: corrosion, paint coating, electrochemical protection, control, reference electrode, complex methods, human factor.

According to its properties and chemical composition, sea water is a highly corrosive environment. This circumstance is the main cause of intensive corrosion processes of the ship's hull, hull structures, systems, devices and mechanisms. The intensity of corrosion is determined by a complex of factors of different nature. For example, increased corrosion in the variable waterline area of ships and vessels is due to the increased oxygen content in the surface layers of water. The presence of a large number of microorganisms in seawater also contributes to the acceleration of corrosion and fouling of metal structures in contact with water. The vital activity of microorganisms significantly accelerates the process of destruction of the anticorrosive coating and contribute to the development of local foci of corrosion.

The application of general methods of corrosion protection is aimed at reducing the intensity of corrosion and preventing local corrosion, corrosion-erosion and corrosion-mechanical damage to materials and structures. Comprehensive protection against corrosion of floating structures should provide the possibility of the rational use of various methods of control and protection to ensure the reduction or prevention of corrosion [1, 2].

Comprehensive protection of metal hulls of ships and vessels from corrosion should include quality assurance of the following measures:

1. Selection and application of technological, corrosion-resistant materials for hull structures.
2. The implementation of special processing of shipbuilding steels in order to improve their anticorrosion qualities.
3. The application of surface treatment with paint and protective coatings.
4. The implementation of electrochemical protection of metal hulls and their elements.
5. Effective monitoring of corrosion protection systems.

The first two protection groups relate more to constructive processes, since the steel sheets for both ship building and for replacing the hull during dock repairs are supplied in ready-to-use form. However, at this stage it is necessary to carry out certain types of control, including laboratory methods, to check the anticorrosion properties of steel and its compliance with the passport data.

According to [3] effective use of paint and varnish protective coatings requires the consistent implementation of technological operations: a reasonable choice of paint and varnish materials, technological processing of the surface before application of the material, determination of the composition and consistency of paint and varnish materials, surface treatment of the coating in accordance with the technological map and control measures to determine the quality of work. The main type of control at this stage is visual control, including the use of special technical means of control.

In order to implement comprehensive protection of metal hulls of ships and vessels from corrosion at this stage, in addition to traditional measures of quality control, in our opinion, it is necessary to add two more types of objective control.

Firstly, quality control of paints before use is necessary. The lack of centralized supply and the possibility of independent choice of both the material itself and its supplier requires a reasonable approach. The cost of the material should not be a priority indicator, as it does not reflect the ability of the material to provide high-quality protection of the ship's hull.

Secondly, the quality control of the paint and varnish protective coating after the launching of the vessel should be carried out. Complex corrosion protection of the underwater part of the vessel's hull should include the use of paint and varnish coatings together with the use of electrochemical protection.

An effective method of corrosive protection of metal materials is electrochemical protection. Its implementation is based on reducing the corrosion rate of metal structures by shifting the potential to a value corresponding to the minimum dissolution rate of the metal. Thus, the task of electrochemical protection is to reduce corrosion in areas with local damages of paint coatings, where in the absence of electrochemical protection, ulcerative and pitting corrosion develop. This process increases the roughness of the ship's hull and high rates of local corrosion.

Currently, two main types of electrochemical protection are used on the underwater part of the hull: cathodic protection (superimposed current) and tread protection. The type of electrochemical protection is determined at the design stage of the vessel, taking into account its functional purpose and expected operating conditions.

In the course of operation, repair and modernization of ships and vessels, it is necessary not only to maintain the selected type of protection, but also to ensure its operability at all stages of vessel use.

In general, the cathodic protection system includes three main elements: a power supply unit, working anode units, and reference electrodes. (Fig. 1)

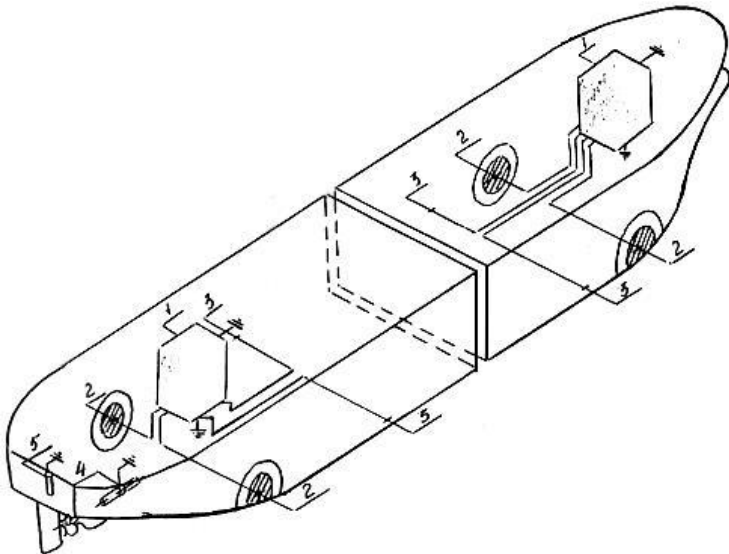


Fig. 1 Schematic diagram of automatic cathodic protection

- 1 - automatic power supply unit (rectifier);
- 2 - anode units;
- 3 - reference electrodes;
- 4 - contact brush device;
- 5 - steering wheel ground cable

Static converters with an output voltage of 12 or 24 V are usually used as the power supply unit. Semiconductor rectifiers with automatic control have proven themselves in cathodic protection systems.

The standard anode unit consists of a working surface of the anode, which is a 50 microns thick platinum foil deposited on a titanium or niobium base by heat rolling in an argon and insulation system. Typical cathodic protection systems are equipped with anode units of certain brands, depending on the characteristics of the vessel.

The reference electrodes included in typical cathodic protection systems are silver chloride electrodes with a porous diaphragm, which protects the meter from the effects of the oncoming flow of sea water.

The cathodic protection system provides regulation of the main parameters - current output and length of protection. The location of the stern anodes is regulated by the size of the vessel and is 10-15 meters from the propeller screw. Silver chloride reference electrodes are located at points with the lowest potential reduction. During the work on the ship's hull, the surface of the anodes and reference electrodes should be protected from pollution and mechanical damage.

Thus, an integrated approach to the use of cathodic protection systems should include not only maintenance measures, but also continuous monitoring of the system's operability during operation.

Standardization and regulations for painting of the underwater part of the ship's hull determine 4 types of paint system. If the painting system of a vessel according to international standards ISO 8501 – 8504 is of the type IV, then only the tread protection is applied on such a vessel [3].

Tread protection, in fact, is a simplified form of cathodic protection. In this case, a protector, which is an alloy of electronegative metals, is installed on the protected surface, whose dissolution in sea water protects the main metal of the hull structures from destruction. The General characteristics of the main types of tread alloys are presented in table 1.

Table 1
The basic characteristics of tread protection materials

Alloy composition	Theoretical current output, A·h/kg	efficiency ratio, %	Potential		Density, g/sm
			stationary	working	
Zn to USMil Spec A-18002-j	781	95	-0,82	-0,73	7,1
Al-Zn (3,5-5) In (0,015-0,025)	2600	88	-0,82	-0,70	2,8

Alloy composition	Theoretical current output, A·h/kg	efficiency ratio, %	Potential		Density, g/sm
			stationary	working	
Al-Zn (4-6) Zr (до 0,1)	2880	85	-0,82	-0,70	2,8
Al-Zn (4-6) Mg (0,5-1,0) Sn (0,05-0,1)	2880	85	-0,90	-0,80	2,8

The tread protection does not provide for current regulation, therefore, for the even distribution of current, the treads are evenly placed along the underwater surface of the vessel. An approximate typical layout of the protectors in the underwater part of the ship's hull is shown in Fig.2. To prevent, the separation and damage of the protectors when mooring the vessel, they are placed in the zygomatic part. For mutual overlapping of protection areas, the distance between the treads of the main types of marine vessels is usually 6-8 meters.

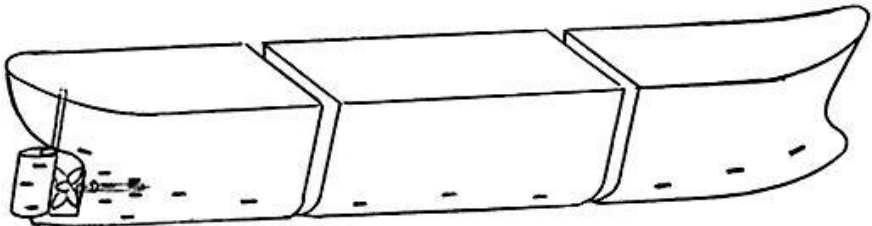


Fig.2. General layout of protectors on the underwater part of the hull

When installing tread protectors, one should take into account both the geometry of the hull and the features of its operation.

Due to intensive corrosion processes in the area of the propeller, there must be at least 1/4 of the entire tread mass used to protect the stern.

At the same time, it is necessary to take into account not only quantitative indicators, but also it is necessary to ensure the operability of both individual protectors and the protection system as a whole.

In this regard, an important stage of the organization of complex protection of metal hulls of ships and vessels from corrosion is to ensure monitoring of the condition and operability of protection systems. According to [3] during the operation of the tread protection system the hull potential of a floating object must be measured periodically once a month. The potential is measured at control points along the entire length at a depth of up to 0.5-1.0 m with a portable silver chloride reference electrode and a portable millivoltmeter.

Studies [4-7] have shown that such a frequency of monitoring to provide comprehensive protection of the ship's hull from corrosion is obviously insufficient, and the proposed measurement method using a silver chloride reference electrode is time-consuming and not perfect.

Visual inspection of the underwater hull with the help of divers, using underwater television and photography is quite expensive. This method does not allow to fully determine the operability of an integrated corrosion protection system, and therefore a high-quality continuous examination of the hull in accordance with the requirements of the guidance documents [8]. It is especially difficult to carry out these actions when there is insufficient transparency of water.

Given the importance of monitoring the status and operability of protection systems, it is more appropriate to use the professor Shvecov's method for these purposes [9]. The basis of this method is usage of devices based on electro-carbon products as a reference electrode. In this case, the frequency of measuring the potential of the vessel's hull at the control points should be at least 1 time per week.

To summarize our analysis we can draw the following conclusions:

1. The methods of organizing the integrated corrosion protection of metal hulls of ships and vessels, proposed by the guidance documents, are insufficient to achieve the goal.
2. It is necessary to further improve the methodology of corrosion protection of ships and vessels, with the widespread use of better control methods at all stages of technical operation.
3. The proposed method of continuous monitoring of the operability of the tread protection of metal hulls of floating objects [9] is the most effective for providing comprehensive protection of ships from corrosion.

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