ACTUAL PROBLEMS OF MODERN SCIENCE, EDUCATION AND TRAINING

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CONTENTS

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THEORETICAL AND PRACTICAL BASIS OF TECHNOLOGIES TO DEVELOP PHYSICAL TRAINING TECHNIQUES OF STUDENTS IN LEVELED GROUPS AT HIGHER EDUCATIONAL INSTITUTIONS

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Annotatsiya. Ushbu maqolada oliy ta’lim muassasalari talaba-larining jismoniy tarbiya mashg’ulotlari jarayonini modulli-reyting texnologiyasi asosida tashkil etishning nazariy va amaliy asoslari yoritib berilgan.

Kalit so’zlar: Jismoniy tarbiya, pedagog, talaba, modulli-reyting ko’rsatkichi, pedagogik texnologiya.

Аннотация. В статье освещенный теоретические и практические основы организации процесса занятий физическим воспитанием студентов высших учебных заведений на основе модульно-рейтинговой технологии.

Ключевые слова: Физического воспитания, педагог, студент, модульно-рейтингового показатель, педагогический технология.

Abstract. The article discusses the content and essence of the organization of physical training classes for students of higher educational institutions on the basis of modular-rating technology.

Key words: Physical education, pedagogue, student, modular-rating, indicator, pedagogical technology.

Introduction. The foundations of the concept of higher education in the Republic of Uzbekistan and the modern requirements for the process of physical education of students require the creation and implementation of innovative educational technologies. Such innovative educational technologies should be based on completely new approaches to planning the learning process, improved methods of analyzing and monitoring the physical fitness and functional status of students.

A number of problems have arisen in the physical training and development of young students, the solution of which, along with improving certain aspects of this process, will increase its effectiveness and, ultimately, bring it into line with modern higher education requirements.

Literature review. One of the main problems, in particular, is the lack of modern pedagogical tools that allow you to quickly obtain complete and objective information about the state of physical fitness and somatic health of students, as well as individual rapid assessment. This obstructs the effective management of the physical education process, the necessary measures to make adjustments to the learning process - the definition of measures, prevention and elimination of adverse effects [2].

This problem can be solved by the widespread introduction of a fast, individual-oriented module system into the physical education process of students. It is known

that the physical education of students is a key element in the organization of the pedagogical process using person-oriented technologies [3,6].

The reaction of the human body and its basic functional systems to weightlift is always of individual character [4]. Therefore, weight amount and its characteristics should be determined taking into account the current functional capabilities of students. In turn, the planning of the process of physical training should be based on a lamination approach aimed at the targeted improvement of weak points of physical qualities of students [7].

At the same time, the most important aspect of such innovations in physical education is to increase the motivation of students to physical training and to strengthen their activities in the field of physical training and sports, as well as it requires extensive involvement in physical education and sports so that they can engage independently and consciously. [1]. Modern trends in the development of the educational process in higher education are characterized by an increase in the share of independent work of students, which determines the growing importance of self-control [5].

Analysis of data presented in special scientific and methodological literature, the results of surveys and analysis of indicators of physical development, functional status and dynamics of physical fitness of students of non-specialized higher education institutions (HEIs) based on the results of the study of the modular rating show that the university serves as a basis for the development of innovative technologies for the development of students' physical qualities in leveled groups.

Theoretical and methodological basis of the research are:

The principles of the theory and methodology of management of physical education of students in higher education institutions;

Methodological approach to improving the process of physical education; conceptual individualization in the system of training of physical abilities;

Views on the organization of individual physical education of young people studying in higher education institutions;

The rules on the dependence of various components of physical training of athletes on factors and the gradual addition of the functional reserves of the body to the training of physical activity.

A pedagogical methodology based on theoretical, methodological and practical rules has been created as a result of the analysis of the literature and scientific-methodological sources,

Analysis and results It allows the integration of science-based approaches to implement the process of improving students ’physical fitness.

1. Fundamental rules include:

a) Systematic approach, its main components:

- integrity in the analysis of the studied object of research - the leading characteristics of the system of physical training of students and the essence of its definition;

- the hierarchy in the organization is reflected in the multi-levelness and interdependence of personal physical training and its elements;

- constituency, which indicates that the "battery" of the main qualities and the parameters are within the limits of the characteristics of the physical fitness of students.

Physical training is considered as one of the fundamental components of an individual's physical culture, which includes intellectual, motivational - values and personal biological elements;

- the principle of constituency has all the features of the system of "personal physical culture" as a description of the phenomenon of "physical training";

b) Process approach:

- the organization of training sessions in order to influence the guidelines of design for the process of formation of the student's personality and the achievement of the final result;

- repetition of effects, which reflects the main components of physical training: the continuity and gradual increase in the amount and intensity of training tasks;

- the value of the final impact by expanding the opportunities for vital activities based on the principles of the highest level of physical fitness of students;

- the application of the modeling method as a means of imagining the manifestation of the qualities under consideration;

c) proactive approach:

- the formation of communication motives among students, which are an important part of the process of interaction in the field of physical training;

- formation of personal qualities, including emotional, volitional and spiritual qualities of students in order to form a stable attitude to themselves and the surrounding world;

- the formation of spiritual activity based on the emergence of various forms of internal activity aimed at acquiring knowledge of physical culture and sports activities;

2. Theoretical and methodological aspects of human ontokinesiology related to the tasks of physical education and sports activities of students are:

- the main scientific and practical rules of formation of the kineseological reserve of the individual in ontogenesis are based on the principles and methods of managing physical fitness;

- active involvement of students in physical training and sports activities;

- the change in the physical activity of students depending on the state of scientific and technological development;

- a set of fundamental rules that expand opportunities for the activation of physical activity, which form the kinesiological reserve of the individual in terms of social and biological basis;

3. The following rules are identified to form the physical abilities of students in the theory of sensory progressive periods of qualities and characteristics of the individual in the process of ontogeny in accordance with the issues of physical culture and sports training of different age groups of the population:

- relative decline of interest to physical fitness among some students.

- adequate consideration of the compatibility of social and biological development in the education of physical and dynamic qualities of students;

- the degree of obvious sensitivity of a number of systems of the student's body to physical weight during exercises;

- the need to adjust the amount of educational impact to the physical development of students in order to eliminate the presence of adaptive disorders.

Admittedly, a number of researchers provide scientific data on the variability of physical fitness indicators of students studying in different educational institutions, occupying different specialties and programs (in which training is quite different). For this reason, the authors consider it appropriate not to rely on them in the development of planning documents for the training process. Based on the above considerations, the indicators recorded in the dynamics were taken into account in the study of the group of students who participated in the initial observations during the study.

4. The theory of sports training (in terms of its main components):

- a set of different tools and methods of sports training, depending on the purpose;
- to determine the structure of factors regulating various types of sports training, such as the dynamics of achieving sports results;
- the difference in the composition of the principles of sports training by a group of individuals involved in the process of physical training and sports activities;
- the concept of managing the process of sports training.

5. The theory of physical training and physical culture in terms of covering the fundamental general pedagogical and special principles of the process of sports training in relation to the tasks of planning the educational process of students.

6. The theory of the influence of the external environmental (social) and biological determinants on the body of different age groups of people engaged in physical training. The main social determinants affecting the level of physical fitness technology of development of physical fitness and development of students in leveled groups should include the followings:

- to facilitate the process of physical training in higher educational establishment with dignity and organization, material and technical equipment.
- the existence of reasonable programs for the development of physical culture at all levels in the case of state subsidies;
- the main target areas of the process of physical training and the degree of adequacy of students' attitudes to physical education (academic and independent);
- the raise of interest in a healthy lifestyle, physical exercises and physical activity formed in the student community, as well as striving to master the values of physical education and sports.

As for the biological determinants that seriously affect the process of physical education of student youth can include the following:

- representation of basic physical qualities in connection with heredity;
- interrelation of student activity with the functional state of life support systems;
- the definition of this or that form or type of physical activity by the interaction of a number of parts of the student's body.

7. The identified physical fitness indicators of students were taken into account in initial research stage.

Summary The results of pedagogical experience allow us to conclude that the use of a differentiated modular technology to improve the physical fitness and development of students on the basis of modular-rating indicators of "physical development", "functional status" and "physical fitness" helps students to significantly increase their physical qualities, increases the effectiveness of the physical education

process in higher education institutions not specialized in physical training.

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PROBLEMS OF FORMATION OF PROFESSIONAL SPEECH OF FUTURE PEDAGOGICAL PHILOLOGICAL STUDENTS

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Annotatsiya. Ushbu maqolada o'qituvchi-filologning og'zaki nutqini shakllantirish shartlarini, shuningdek, uning tarkibiy qismlarini o'rganish va tavsiflashga bag'ishlangan bo'lib, unda: nutqning lingvistik dizayni sifati, argumentativligi, nutq so'zlashlarining standarti haqida so`z boradi. Maqolaning maqsadi rus tili o'qituvchisining og'zaki professional nutqini xorijiy til sifatida shakllantirish shartlarini, shuningdek, uning tarkibiy qismlarini o'rganishdir.

Kalit so'zlar: professional nutq, nutq madaniyati, kommunikativ vaziyat, nutqning dolzarbligi, mantiqiylik, aniqlik.

Аннотация. Статья посвящена изучению и описанию условий формирования устной профессиональной речи преподавателя-филолога, а также ее компонентов, к которым относятся: качество языкового оформления речи, аргументированность, стандартность речевых формулировок. Целью статьи является изучение и описание условий формирования устной профессиональной

речи преподавателя русского языка как иностранного, а также ее компонентов, к которым относятся.

Ключевые слова: профессиональная речь, культура речи, коммуникативная ситуация, уместность речи, логичность, точность.

Abstract. The article is devoted to the study and description of the conditions for the formation of the oral professional speech of a philologist teacher, as well as its components, which include: the quality of the language design of speech, reasonableness, standardness of speech formulations. The purpose of the article is to study and describe the conditions for the formation of oral professional speech of a teacher of Russian as a foreign language, as well as its components, which include.

Key words: professional speech, speech culture, communicative situation, relevance of speech, consistency, accuracy.

Introduction. Professional speech is the communication of people, speakers of any profession with the help of language. Professional speech of any area is also determined by its repertoire of genres, although the same genres can be used in professional speech of different specialties, but at the same time, each specialty has its own most important genres and specific laws of composition and speech design of general genres.

Literature review. In the development of the world educational school, among such outstanding thinkers as Shakespeare, Tagore, Goethe, Kashgari, Navoi, Lomonosov, Pushkin, Tolstoy, Mayakovsky, the eastern educator Abu Nasr Al-Farabi occupies a significant place. Separate statements of Abu Nasr Al-Farabi about language, speech, culture of speech are found in his books: "Kitob al-alfoz va alhuruft" (A book about words and letters), "Kalom lahlu fi ma`no ism al-falsafa" (On the meaning of the word "philosophy"), "Abu Nasr Al-Farabi sozi" (Book of sayings of Abu Nasr Al Farabi) and others [1].

Expressing his thoughts about the origin of sciences, Abu Nasr Al-Farabi believes that the primary and very first science is language, science to give a name to the concepts of an object, an object, an event-phenomenon: “Speaking about how to teach and learn, how to express a thought , to express how to speak and respond, I argue that the first of these sciences is the science of giving names to objects, that is, substances and accidents ”[2]. Speaking about philosophy, logic, knowledge, reason, morality, spirituality, etc., Al Farabi focuses on the meaning and place in this area of language. He, denoting 12 requirements and conditions that a moral person must meet, gives the following requirements related to speech, culture of speech, oratory.

Research Methodology. The complexity and multidimensionality of people's professional activities presuppose a significant variability in the forms of speech communication and with a fairly broad view of things, all speech genres that have developed in the process of communication in the professional field of activity can be defined as professional speech.

Analysis and results. In other words, all communication related to professional activity, regardless of whether it takes place in written or oral form, in an official or informal setting, that is, communication as a special, auxiliary type of activity that ensures the implementation of the main professional activity and is subordinate to its goals as goals activities of a higher order and there is professional speech.

Russian scientist N.K.Garbovsky notes that "... professional speech is a variant of speech, behind which there is a linguistically, psychologically and socially determined choice of linguistic means", which includes professionalisms, terms and words that do not have a special stylistic coloration "[3]. The concept can be supplemented with the following provision: professional speech is any speech related to professional needs, conducted on professional topics, mainly between specialists in this field. Professional speech is determined by the subject of speech (i.e., in fact, by what representatives of a certain profession are engaged in) ...

Professional speech is primarily an oral form of speech, but it can also be written, and this is not only business documentation, but also other types of written business communication and professional speech can take place in an official and unofficial atmosphere and will be professional only if the main task is communication - ensuring professional activity [4]. Distinctive features of professional speech are primarily associated with terms, professionalism, slang.

Noting the lexical side in professional speech, N.K.Garbovsky proposes to single out the so-called professional-communication systems, under which he assumes subsystems in the language system, providing professionally oriented communication of various professional communities of people and semantically correlated with the subjects of activity of these professional communities. Each professional and communicative system, being part of the general system of the language, includes a general and specific part. The general part of the professional communication system is a reduced projection of the language system as a whole.

The components of the teacher's professional speech traditionally include:

- the quality of the language design of speech (correctness, consistency, normativity, argumentation, standard speech formulations);
- value-personal attitudes of the teacher (axiological adequacy of the communication situation);
- communicative competence;
- a clear selection of information for creating a statement (accuracy and clarity, concreteness, brevity);
- focus on the process of direct communication (situational).

To ensure maximum accessibility, it is necessary to use common words, taking into account the language experience and practice of bilingual students; the use of the most understandable synonyms and metaphors; simple grammatical structures.

Undoubtedly, one of the stylistic requirements for oral speech is expressiveness. "Expressive is a speech in which the expression of one's attitude to the object or form of speech corresponds to the communicative situation, and speech as a whole is assessed as successful and effective" [5]. In oral speech, means of expression include performing means, means of establishing feedback and a great focus on the addressee.

Expressiveness is closely related to the individual style of speech, it often does not have "ready-made recipes" (author), it is sometimes based on the creative approach of the teacher Russian as a Foreign Language, it is very important, the use of this technique was appropriate.

Awareness of the principles of purity of speech is a means of cognitive development of an individual. In the teacher's speech, it is unacceptable to use:

- dialectisms
- barbarisms
- jargonisms
- clericalisms
- vernaculars
- words-parasites
- vulgarisms

An important quality and a necessary requirement for the speech of an Russian as a foreign language teacher is the richness of speech, the most important indicator of speech culture. Speech is considered rich, including professional speech, characterized by a variety of speech and linguistic means used. Rich speech of a teacher is the norm, and poor speech is a deviation from the norm. The richness of speech is the embodiment and development of the requirement of relevance, since it offers a choice of options for the speech embodiment of those elements of communication that are situationally appropriate. The poor speech of the teacher can be satisfied with the repetition of the same formulas, the rich one finds a source of diversity in the description of the same linguistic or cultural phenomenon. Along with the lexical stock, the sources of the variety of means of expression are the phonetic, derivational, grammatical richness of the Russian language, as well as the palette of super-segmental linguistic means (intonation, tempo, posing).

Speech is called accurate if the meanings of words and phrases used in it are fully correlated with the semantic and objective aspects of speech [6]. Accuracy of speech, in our opinion, is how quality closely correlates with the key concept of situational relevance: the most accurate speech most closely meets the communicative requirements, the most direct way leads to understanding speech. Accuracy is associated with the requirement of accessibility, however, the quality of accessibility is focused primarily on the level of language and cultural training of the addressee, while the quality of accuracy is focused on the language system and the subject of speech. Accuracy presupposes the coincidence of presuppositions and contributes to the convergence of understanding of the linguistic embodiment of concepts in intercultural communication (and in fact, the work of a teacher of Russian as a foreign language is built in the area of intercultural communication). Accuracy not only helps to understand speech, but also helps to get as close as possible to the linguistic meaning of a word, concept, phenomenon.

The purpose of the article is to study and describe the conditions for the formation of oral professional speech of a teacher of Russian as a foreign language, as well as its components, which include:

- the quality of language design of speech, argumentation, standard speech formulations;
- value-personal attitudes, axiological adequacy of the communication situation;

- communicative competence; a clear selection of information to create a statement;
- focus on the process of direct communication (situational);
- in addition, the definition of specific requirements for the design of the oral professional speech of the teacher of Russian as a foreign language.

Conclusion. The allocation of oral speech as a fundamental component of the success of verbal communication in the language educational process allowed the author to search for an effective way of forming the oral professional speech of the teacher Russian as a foreign language. This is facilitated by the conditions that determine the purposefulness and controllability of the process of professional training of students, as well as conditions that contribute to the design and optimization in the process of communication of pedagogical interaction, and the conditions related to the technological side of training students - future teachers Russian as a Foreign Language.

An important component of the teacher's communicative culture is the observance of the norms of etiquette, which at the same time can serve as material for the study of Russian speech etiquette. So, the teacher must correctly use and be able to explain the peculiarities of national greetings and farewells, the difference in addressing "you" and "you", the peculiarities of non-verbal etiquette ("do not greet over the threshold", etc.). As a result of the well-thought-out activity of the teacher in this direction, “teaching the culture of communication, taking into account the national specifics, will allow students to more consciously and motivatedly use etiquette norms not only in a foreign language, but also in their native language”.

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SCIENTIFIC BASIS OF FORMATION OF ORAL SPEECH COMPETENCE IN MOTHER TONGUE EDUCATION

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Annotatsiya. Ushbu maqolada ona tili ta`limida og`zaki nutq kompetensiyasini rivojlantirishning ilmiy asoslari, og`zaki nutqni ta`limda shakllantirish usullari haqida so`z boradi. Shuningdek, nutq o`stirishga oid adabiyotlar, o`quvchi va talabalarning tovush madaniyatini shakllantirish, ularni so`zlashuv nutqiga o`rgatish tadqiq qilingan.

Kalit so'zlar: nutqning kommunikativ vazifasi, og`zaki nutq, grammatika, innovatsion o`yinlar, tovush madaniyati, so`zlashuv nutqi.

Аннотация. В статье рассматриваются научные основы развития устной компетенции в обучении родному языку, методы формирования устной речи в обучении. Также изучалась литература по развитию речи, формированию звуковой культуры школьников и студентов, обучению их речи.

Ключевые слова: коммуникативная функция речи, устная речь, грамматика, новаторские игры, звуковая культура, разговорная речь.

Abstract. This article discusses the scientific basis for the development of oral competence in mother tongue education, methods of formation of oral speech in education. Also studied the literature on speech development, the formation of sound culture of pupils and students, teaching them to speak.

Key words: communicative function of speech, oral speech, grammar, innovative games, sound culture, colloquial speech.

Introduction. First of all, speech development, with all its content, is aimed at the comprehensive development of the student's personality. In addition, speech development is based on the data of psychology on the acquisition of oral speech by pupils and students, the theory of the characteristics of human cognitive activity. Speech development is also based on didactic principles based on the theory of the role of speech activity in the development of pupils and students, speech education in educational institutions in each group consists of the following knowledge:

1. To acquaint pupils and students with the environment, to develop speech, to enrich the vocabulary of the language.

2. Forming the grammatical side of speech.

a) Fostering a sound culture of speech.

b) formation of colloquial speech (dialogue) in the native language.

c) introduction to fiction [7].

The teacher should be able to clearly define the sections of the literature on speech development and the requirements of each section and clearly define its content.

Literature review. It is recommended that pupils and students deliver oral speech through objective explanation. Therefore, the content of the work on mastering the

grammatical structure of speech in the lesson is determined in each group of language learners, taking into account the class, course and individual characteristics of students.

The formation of the sound culture of speech is one of the main features of speech development in the native language. Sound and correct pronunciation include the correct pronunciation of all sounds in the native language, the expressiveness of diction and intonation, correct breathing and output during speech, regulation of tone and tempo of the voice. Determines the ability of pupils and students to speak clearly, slowly, loud enough in the native language, to pronounce words piece by piece, to pronounce vowels and consonants correctly, to use intonation correctly. The tasks of teaching the native language in education are carried out in each group, taking into account the class, course and psychological characteristics of pupils and students. Because the level of language acquisition of pupils and students may be different.[1]

Teaching pupils and students to speak. It will be necessary to develop a program to teach students to speak. It is recommended to prepare questions in the native language in advance, depending on the type of question. Teaching them to answer questions for the whole group one by one, to speak in groups, to participate in conversations, to listen attentively to the answers of peers and to ask questions themselves will lead to an effective change in speech in their native language. . At the same time, when talking to native language teachers, positive qualities such as sincere, meaningful speech are nurtured. Today, the method of developing connected speech, that is, teaching storytelling, is widespread in educational institutions.[5]

Introduction to fiction. In order to increase and develop students' interest and love for fiction in the native language, stories, poems are read to students, fairy tales are told, poems are memorized. The educational programs include tasks such as reviewing the pictures in the book, describing it correctly in the native language, understanding the content of the work, assessing the behavior of the protagonists, cultivating the charm of artistic expression. Two features play an important role in the process of education in educational institutions: acquaintance with the environment, the development of speech. It is based on the teaching of the mother tongue in educational institutions and thus the development of students' oral speech.

One of the main means of developing student speech is education. The main form of education is practical training. In the practical lessons of speech development in the native language, the student compares his speech with the model speech of the teacher, performs teaching materials with other students, that is, listens to the teacher's explanation, story, sings together to a specific object, teaches to pay attention, to speak in turn.[2]

Research Methodology. According to the didactic purpose of teaching the native language, the following types can be specified: lessons describing new materials, lessons that strengthen knowledge, skills and abilities, lessons that generalize knowledge, systematize lessons, final or checker-accountant-tester mixed exercises. In the course of the lessons, extensive use is made of previously acquired knowledge, skills and competencies.

At the beginning of the academic year, it is advisable to conduct tests on certain knowledge in order to determine the knowledge of newly admitted students. It is expedient to transfer to the purpose of the conclusion of the work done.

Analysis and results. The use of more mixed types of lessons has been introduced in educational institutions designed to teach the mother tongue. For example, in one lesson, students are introduced to new educational material, previous knowledge is repeated and strengthened. Speech development has its own characteristics, and sometimes there are difficulties in conducting the lesson. In visual arts, physical education, music, all students are equally active, not all students are equally active in speech development. Some students answer questions such as drawing a story, answering questions, and others complete the answers of their peers [4, p. 102].

The following didactic requirements should be strictly observed in the organization of lessons by each teacher:

1. Thorough preparation for the lesson, its content, methods of teaching

2. Distribution of mental workload (predetermining mental stress). Following the developmental principle of education, the teacher gives students complex tasks that require mental activity.

3. To have educational nature of lessons.

4. Enthusiasm of lessons. Before starting the lesson, it is necessary to instill in students a desire to learn, a curiosity, a desire to learn something new.

5. The choice of teaching methods depending on the structure of the lesson.

The structure of the lesson should be clearly defined in advance. At the beginning of the lesson, when introducing the new material, the materials learned in the previous lessons are taken into account and connected with the student teacher. Organizing the beginning of the lesson in an effective and interesting way will arouse the interest of students in the subsequent parts and ensure the stability of their attention.

Therefore, the use of interactive games in mother tongue lessons is a good idea. Then students work independently, but are supervised by a teacher. The final part of the lesson should be short and lively, that is, to strengthen the material learned in the lesson, read the beginning of works of art that are close to the topic, recite poems, tell riddles. It is advisable to use methods such as `yin. If the lesson is of mixed type, then in the first part it introduces a new topic, and it is based on the above scheme. The rest of the lesson is devoted to material that is familiar to students, but in these parts also uses the changing methods of teaching and the changing methods of teaching.

For example, when a teacher asks a student to recite a poem by heart, he explains to him how to recite the poem (sadly or politely) and why. Planning the structure of the lesson takes into account the transition from easier to more complex, from enthusiastic to more enthusiastic. 1-2 minutes between classes.[3]

6. To increase the speech activity of each student at all stages of the lesson. "Speech activity" means that the student actively understands and comprehends the speech of the teacher and peers, rather than speaking in a way that is audible to everyone throughout the lesson. Properly selected and structured questions and assignments are also one of the means of ensuring speech activity. When the teacher asks questions, he addresses all the students in the group, repeats them if necessary, instructs the respondent to speak loudly, clearly and intelligibly to everyone, takes turns

with students with different levels of speech development. Asks, does not ask the same student several times, checks whether the student in the group answering is correct or incorrect, asks them a question: is he correct and gave a complete answer what else was he supposed to talk about? Did he speak in order and so on?

7. Combining the collective-collective learning of education with an individual approach to students is a frontal form of work - it is a general task, the general rhythm is to respond in unison, and these, in turn, are separate tasks for students, is carried out in conjunction with. The teacher should take into account the level of knowledge and skills of the student, the interest in the choice of individual tasks and methods. The teacher should pay special attention to students with speech impediments. He should also be one-on-one with students who are silent, unwilling to communicate, unable to behave.

8. Proper organization of training. During the training, the environment must meet aesthetic requirements.

9. Taking into account the results of training. During the lesson, the teacher observes the student's speech and writes down his answer in a notebook. This will help the teacher to determine the future tasks.

10. Reinforce the material from other activities or activities. It is very important to comply with this requirement. Because in the process of work on the development of students' speech, complex mental skills and abilities are formed. Mother tongue is taught to students in other classes as well. This, in turn, indicates the greatness of speech in the organization of various activities of the student.[6]

Conclusion. Developing communicative competence is an interesting but not an easy task. The ability to speak and create gradually develops: knowledge is accumulated, general culture, literacy, the ability to express one's thoughts grow, the person is educated and developed. Students do not learn to think, reflect, think, create, they need to be taught gradually, skillfully, experimentally. The technologies presented in the study allow to achieve this result.

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WAYS TO OVERCOME AGGRESSION IN MARTIAL ARTS

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Annotatsiya. Ushbu maqolada "agressivlik" tushunchasi, uning paydo bo'lishining sabablari, tadqiqot natijalari va sportda agressivlikni bartaraf etish usullari ko'rib chiqiladi. Ma'lumki, muvaffaqiyatga erishishda agressivlikni bartaraf yetish uchun o'ziga ishonchni shakllantirish va motivatsiyani rivojlantirish kerak. Maqolada o'qituvchilarga o'z-o'zini hurmat qilish, o'ziga ishonchni oshirish bo'yicha uslubiy tavsiyalar berilgan. Yosh sportchilarning muvaffaqiyati mezonlari ko'rsatilgan. Sportchilarda muvaffaqiyatga erishish uchun motivatsiyani shakllantirish omillari batafsil keltirilgan..

Kalit so'zlar: agressiya, sport, agressivlikni yengish.

Аннотация. В статье описаны понятие, причины, методики измерения, рассмотрены результаты исследования и способы преодоления агрессии. Выявлено, что для преодоления агрессии необходимо развитие адекватной самооценки, уверенности в себе и мотивации достижения. В статье предложены методические рекомендации педагогам по формированию адекватной самооценки, уверенности в себе. Критерии успеха юных спортсменов. Подробное описание факторов мотивации спортсменов к достижению успеха.

Ключевые слова: агрессивность, спорт, преодоление агрессивности.

Abstract. The paper describes of the concept, reasons, measurement techniques, results of the research and ways of overcoming aggression are considered in the paper. It is revealed that to overcome aggression it is necessary to develop adequate self-appraisal, self-confidence and achievement motivation. The article offered methodic recommendations for teachers for the formation of an adequate self-esteem, self-confidence. Criteria for success of young athletes. Detailed description of factors of motivation to achieve success in athletes.

Key words: aggression, sports, overcoming the aggression.

Introduction. We all know that in our country, appropriate measures are being taken to effectively form a system of support for physical culture and sports, to create a modern sports infrastructure, to ensure the country's worthy participation in international sports arenas. At the same time, it is necessary to implement specific programs in the field of physical culture and sports to strengthen the health of the population, attract young people to sports and select talented athletes, form national teams with skilled athletes and coaches. There is a need to create conditions. [1] Today, sports competitions are advancing worldwide. At the heart of the effectiveness of pre-competition physical, technical and tactical training of athletes, especially in martial arts, is the ability to optimally manage their emotional state.

Literature review. Many authors have suggested different ways of optimizing aggression in their research. Aggression is a set of individual and collective actions aimed at causing physical and mental harm to a group of people. The whole history of mankind convincingly proves that aggression is becoming an integral part of the life of the individual and society. In addition, aggression, with its enormous gravitational and contagious nature, many deny that it is aggressive, but in its daily life, it is widely demonstrated. It is aggressive behavior that leads to interpersonal conflicts and unfounded ways of resolving them. One of the types of behavior that manifests itself in relationships between athletes in sports is aggression. Explaining the concept of "aggression" poses a number of difficulties, as the term refers to many forms of behavior. When people describe someone as an aggressive person, they can be described as insulting or bad-tempered, wanting to do everything as they please, or defending their ideas, immersing themselves in an unresolved problem. There is not enough research on this topic today. As for wrestlers, this aspect of the problem of aggression remains unexplored. The purpose of our study is to consider the specific features and importance of aggression in wrestling, the adaptation of wrestlers to life outside the sport, the possibility of pedagogical correction, taking into account his personal situation, depending on their aggression. Although aggression has played an important role in the process of human evolution, some scientists believe that aggression is not inherent in human nature because children learn aggressive behaviors almost from birth. [2]

Research Methodology. Causes of aggression Psychological processes such as internal conflicts, identification, decentralization - limiting aggression, as well as various conflicts, such as empathy, are seen as the key to understanding and independent assessment of human values [3]. Because aggression requires significant energy and motivational action, for example, the term "aggressive" has come to be used as a characteristic feature of athletes, which refers to perseverance in overcoming obstacles needed to achieve a goal.

Analysis and results. In sports psychology, there are disagreements about the nature of physical aggression in athletes. This is reflected in the definitions of aggression that occur in the context of sports and in the discussions about the different types of aggression [4]. He hypothesized that there are four different types of aggression in sports (play, anger, power, and exciting aggression). Therefore, the coach should monitor and take action against each athlete to minimize their level of unwanted aggression and direct it in the right direction. To measure the level of aggression, we were able to obtain the intended results, especially by using the Bass-Darki survey. The following forms of aggressive behavior have been identified by A.Bass and I.Dark.

1. Physical aggression - refers to the use of physical force against another person;
2. Verbal aggression - verbal expression of negative emotions (swearing, swearing, verbal threats, cursing, cursing);
3. Indirect aggression - gossip directed at another person, indirect pain in the form of pitching, hatred directed at no one (kicking, shouting);
4. Negativism - reactions from the simple opposition to existing laws to the struggle with them (negative attitude to reality, denial of everything);
5. Jizzakh - a tendency to jizz, to explode into trivial things, to be rude;

6. Suspicion - a tendency to insecurity, suspicion of people, to treat them with caution, to live with the idea that others can harm;

7. Anger is a manifestation of resentment, hatred, and envy towards those around you, from the whole world or from someone, from grief, fantasy, or real suffering;

8. Autoaggression is a feeling of guilt that is observed in the relationship between oneself and the environment, self-directed behavior (self-blame, eating the flesh of oneself as I am, that I am) [11] he answers. The Bass-Darka survey allows you to determine such a level.

Any person must have a certain level of aggression, otherwise its absence will lead to a conflict between the passivity of the person and the overdevelopment of aggression Uzbek state university of Physical culture and sports (Chirchik).

- As a result, 20% of boxers with a high level of aggression;
- average level - 75.2%;
- low levels of aggression in a total of 4.8% of boxers.

The results of the study showed that in order to overcome aggression, it is necessary to work with young people and achieve the goal. To do this, we have created a pedagogical technology for organizing and conducting training in a sports school on the basis of providing pedagogical support. In doing so, we used the following pedagogical technologies: systematic, personal-oriented, personal-active, communicative, axiological and other tasks:

- Correction of the emotional and volitional field of students;
- Working with fear, especially with fear of loss;
- Harmonization of interpersonal relationships, strengthening the team spirit of athletes;
- Strengthening self-confidence, the will to win on the path to personal and collective success.

The pedagogical technology we proposed was implemented in teaching and learning activities. A number of modern, non-standard methods and techniques (group discussions, trainings, roundtables) helped to implement this technology. In addition, the coach should not forget to develop moral and volitional qualities: purposefulness, patience, perseverance, self-control, patience, courage, perseverance, independence, honesty, self-esteem.

To assess an athlete’s success, a adolescent coach in sports activities should consider the following criteria: his or her independence; the school where he studied; conflict resolution without adult involvement, initiative, perseverance, perseverance, the right attitude to failures, patience, limited negative emotions, as well as fear and insecurity.

Conclusion/Recommendations. In short, it is possible to overcome aggression in athletes, first of all, pedagogical, designed to organize and conduct training in a sports school based on the development of moral qualities of adolescents, self-esteem, self-confidence, pedagogical support related to motivation technology is an integral part of preparing young athletes for competitive activities.

1. Success in sports is achieved by more aggressive athletes, regardless of their specialization, however, the direction of specialization of the sport determines its specificity. Wrestling leads to a decrease in the integration of aggression indicators,

although with other sports Wrestlers adapt to life outside of sports, self-awareness, reading and personal satisfaction, academic performance, ability to solve life problems, sociometric position in the group and social frustration has

2. Aggression is a factor in the adaptation of wrestlers to the sport and affects their success and satisfaction in sports activities. When it comes to success, the negative factors are: doubt, anger, hostility, and guilt. When it comes to sports satisfaction, it is important to keep in mind that different manifestations of aggression in wrestlers can be both positive and negative.

3. It is necessary to take into account the pedagogical program that will correct the aggression of wrestlers, make changes in its characteristics, have a positive impact on their social adaptation. In addition, as a result of the formation experience, a positive change was observed in a number of indicators of their adaptation to sports activities and extracurricular life. The growth found: success in sports and schooling, satisfaction with communication, social status and a sense of satisfaction from the realization of various values of life.

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CRITERIA FOR ORGANIZING STUDENTS' SCIENTIFIC RESEARCH IN THE FIELD OF PHYSICAL CULTURE

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Annotatsiya. Mazkur maqola jismoniy madaniyat sohasida talabalarning ilmiy tadqiqot ishlarini tashkil etishda amalga oshirilishi lozim bo‘lagan mezonlarga bag‘ishlangan bo‘lib, unda talaba va uning ilmiy rahbari tomonidan ilmiy tadqiqot ishlarini olib borishda amalga oshirilishi lozim bo‘lgan tavsiyalar berilgan.

Tayanch so‘zlar: jismoniy madaniyat, taъlim, ilmiy tadqiqot, talaba, tarbiya, oliy taъlim, pedagogika, ilmiy rahbar, sport, tizim, jarayon, soha, standart.

Аннотация. Данная статья посвящена критериям, которым необходимо руководствоваться при организации научно-исследовательской работы студентов в области физической культуры, содержит рекомендации, которые должны выполняться студентом и его научным руководителем при проведении исследования.

Ключевые слова: физическая культура, образование, исследования, студент, воспитание, высшее образование, педагогика, научный руководитель, спорт, система, процесс, область, стандарт.

Abstract. This article is devoted to the criteria that should be followed in the organization of research work of students in the field of physical culture, it contains recommendations that should be implemented by the student and his supervisor in the conduct of research.

Key words: physical culture, education, research, student, upbringing, higher education, pedagogy, supervisor, sports, system, process, field, standard.

The purpose of the national model of training is to radically reform the education system, to raise it to the level of developed countries, to create a system of training highly qualified personnel that meets the highest moral and ethical requirements [1].

Introduction. The current normative and legal documents of education provide a systematic list of higher education in the field of education and master's specialties, the state educational standard of higher education - qualification requirements for a particular field of education (content), the content of education, the necessary and adequate level of general training of graduates , a benchmark level that determines the level of assessment of the quality of training is being developed and improved.

The final state certification of graduates in obtaining a bachelor's degree in physical culture and a master's degree in theory and methods of physical culture and sports in the higher education system of the Republic of Uzbekistan is determined by their final research. It is also recognized as a wall of dissertation work, preparing students for future careers and obtaining an academic degree.

At present, a number of scientific researches in the field of physical culture and sports are carried out not only by researchers, but also by other physical culture and

sports coaches of educational institutions. Creative approach to their work Research work, which involves the search for new, original and effective ways to solve pedagogical problems, is a topical issue today to provide insights and guidance on how to positively affect the future activities of students. To do this, it is possible to train highly qualified, competitive personnel in the future by directing students to this process and teaching them its specific requirements.

Research Methodology. In the implementation of research work carried out by students in the field of physical culture, first of all, it is necessary to accurately and clearly teach and direct the stages of research work. Its types include:

- methodical work;
- scientific and methodological;
- research.

The scientific nature of any research in the field of physical culture is determined not by the type of research itself, but by the fulfillment of the proposed requirements for the scientific work. According to this generalization of pedagogical experience, it is necessary to include in the full scientific work who and to what extent the studied mamma is studied. For example, the concepts of ‘methodical’ and ‘scientific-methodological’ work define the specific features of research. This is characterized by a preference for addressing issues of teaching and learning methods. It is also intended to be used as a software application in scientific research in the field of physical culture and sports, i.e. as a set of resources.

The difference between methodological work and scientific-methodological work is the presence of elements of innovation in it. If a student conducts research on a topic, the student's activities, procedures, research, are limited to acquaintance with their experience to determine the characteristics of the topic, and there is no specific approach to solving the problem, unknown (novelty to develop) research methods can not be found. If an experiment is found with the same generalization, then new patterns of teaching and education will be multiplied in an experimental setting, for such a study it will be necessary to study scientific and methodological materials as well as to make a comparative analysis.

In the research conducted by the student in the field of physical culture, scientific-methodical work is essentially a process of special importance of scientific research. In this regard, it covers not only issues of teaching and educational methodology, but also a wide range of issues in the field of physical culture. This applies to the concepts of research methodology and research methods. A research methodology is a type of research program for a study that is recognized as the result of a comprehensive pre-development of a specific research topic or problem. Research methods are a set of techniques or a set of methods used in research.

Analysis and results. In conducting research on a problem identified by a student in the field of physical culture, it is required to pay special attention to its stages and follow the instructions of the supervising teacher. Any specific research must be presented in several stages. These are:

- choice of research topic;
- description of the object and subject of research;
- definition of goals and objectives;

- volume of research;
- development of hypotheses;
- Development of a research plan;
- work with literature;
- The degree of study of the topic;
- choice of research methods;
- organization of research conditions;
- analysis (collection of materials);
- processing of research results;
- statement of results;
- Formation of research work.

Each stage has its own tasks, which are often solved sequentially, and sometimes simultaneously.

Selection of research topic: The whole scientific research involves solving any scientific problem. Scientific shortcomings, facts, inconsistencies of scientific research create the basis for scientific research. The formulation of a scientific problem includes:

- to determine the abstractness of the chosen topic in practice;
- substantiate the need to eliminate ambiguity;
- goal setting.

It is preferable for the student to explore more competent issues and how they relate to his or her practical activities (sports, education, organization, teaching, or coaching) [3]. However, the proposed topic should be evaluated in terms of the feasibility of the experiment. That is, research teams (experiment and control), the formation of research methods, the availability of a sufficient number of sociological tests to create appropriate conditions for conducting experimental tests should be ensured.

Conclusion/Recommendations. In the field of physical culture, research work on a particular topic by a student is required to be performed independently. In doing so, the student is required to strictly adhere to the rules of professional ethics (do not allow plagiarism, falsification of statistics and other information, as well as false citations). At the same time, there are certain requirements for the student's supervisor.

The responsibilities of the supervisor include:

- create a schedule of consultations to provide systematic assistance on issues that may arise within the research topic;
- Participate in the selection of research methods and assist the student in their application in research;
- control over the implementation of the student's work on the established calendar work plan and the timely preparation of research work in the conduct of research work;
- Summarize the research work before the first defense.

Based on the above, the head of the department and the scientific head are assigned specific responsibilities.

There will be an opportunity to participate in various competitions or to study this research work on a larger scale.

The organization of research work of students in the field of physical culture, as well as the possibility of achieving positive results in this process is carried out in accordance with the above guidelines.

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THE STUDY OF GENERATIONS IN SOCIAL PSYCHOLOGY

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Annotasiya. Ushbu maqolada zamonaviy psixologiya fanida avlodlarni o‘rganishning asosiy muammolari ko‘rib chiqilgan. Mahalliy va horijiy adabiyotlarning tahlili asosida muallif quyidagi xulosalarga keladi, ya'ni avlodlarni o‘rganish avlodlarning keng qamrovli ijtimoiy-psixologik konsepsiyasini yaratishga hissa qo‘shishi mumkin. Muallifning fikriga ko‘ra, jamiyatda faoliyat olib boradigan avlodlarning tabaqalanishi quyidagi mezonlarga asoslanishi kerak: tarixiy davr, yosh, oilaviy roli va boshqa avlod bilan identifikasiyasi.

Tayanch so‘zlar: avlodlarni o‘rganish muammolari, avlodlar differensiasiyasi, “avlod” tushunchasi definisiyasi, avlodlar xarakteristikasi

Аннотация. В статье рассматриваются основные проблемы изучения поколений в современной психологической науке. На основе анализа отечественных и зарубежных литературных источников автор приходит к выводу, что изучение поколений может способствовать построение комплексной социально-психологической концепции поколений. В основе дифференциации функционирующих в обществе поколений, по мнению автора, должны лежать следующие критерии: историческая эпоха, возраст, семейная роль и идентификация с тем или иным поколением.

Ключевые слова: проблемы изучения поколений, дифференциация поколений, дефиниция понятия «поколение», характеристики поколений.

Abstract. The article discusses the main problems of the study of generations in modern psychological science. Based on the analysis of domestic and foreign literary sources, the author comes to the conclusion that the study of generations can contribute to the construction of a comprehensive socio-psychological concept of generations. According to the author, the following criteria should underlie the differentiation of the generations functioning in society: historical epoch, age, family role and identification with one generation or another.

Key words: problems of studying generations, differentiation of generations, definition of the concept of "generation", characteristics of generations.

Introduction. The development of society, national prosperity has always been associated with the education and training of the younger generation, new personnel who deeply master modern knowledge, their high qualification. Relying on the achievements of the older generation, the experience they have gained, it has always been the responsibility of young people to further raise the country's scientific, economic, cultural and educational potential. Therefore, the work on the upbringing of the new modern generation in our country, the formation of their worldview on the basis of new values, has risen to the level of state policy, the attitude to education has radically changed. Raising education and training in society has become one of the main directions of state activity. Education of the younger generation is a very urgent issue, it requires consistency, perseverance and perseverance in education, modern, effective methods and means of performance. Everyone understands that the XXI century is an era that is developing rapidly, intensively.

In Uzbek families, the link between generations is very strong. In families, the role of the older generation in educating children on the basis of values, traditions, national and universal values passed down from generation to generation, and being able to integrate the norms of morality adopted by society into children from their youth is important. It should be remembered that the inseparable link between different generations is an important factor in the education and upbringing of our children. After all, no child is born good or bad-natured, educated or uneducated. The attitude of parents towards each other and their children, the reputation of Aries-Aries and the neighborhood -ibibori, the interaction of people belonging to different generations in the family play a key role in the education and upbringing of our children. Taking into account the above, we can say that the study of interrelationship, relations between generations can be one of the important factors in the effective organization of the educational process.

The problem of defining the concept of "generation" in socio-psychological research is closely related to the problem of determining the criteria for differentiation of generations. It is very difficult to establish the official boundaries of the constantly changing generations, as well as the social differentiation, to associate generational differences with other types.

Literature review. Generation is an integral social community, a unit of high complexity, but it is very difficult to distinguish it from the inside and, by the way, each of its elements is highly integrated. The generation, on the one hand, can be

controlled by institutional tools and processes, but on the other hand, it is very difficult to manage the generation processes "from the outside". This complexity is primarily associated with the "multifaceted integrated unit" or figurations of the generation – "the corresponding model of space and time – through the model of the social process that people create among themselves".

Therefore, the idea of choosing several criteria for the differentiation of generations arises. For example, 3.Orteg and X.Gasset considered that the generation is distinguished by two signs: these are the unity of the age and the presence of vital relations [1].

V.Voronkov considered joint activities as a criterion for the differentiation of generations, and in this regard he defined the generation as a community of people [2]:

1) shares certain cultural values and implements them in their cultural practices;

2) creates an area of interaction and relationships;

3) members consider themselves an integral element of the generation, adding to themselves the distinctive aspects of other contemporaries.

M.I. Postnikova noted that the boundaries of generations can be established by applying three criteria at the same time:

1) historical period that influenced the formation of self-awareness;

2) young age;

3) social role in the family. Among these criteria, the author considers exactly the age period as the main feature of the generation [3].

Other authors also talk about the role of age in the differentiation of generations. The A.I.Afanaseva describes the generation as "a Historical Association of people who are objectively developing, close to each other in terms of age and formed in this historical period [4]. The A.V.Tolstix understands that "the time interval between parents and their children is the average age", says generation. In contrast to this point of view, American sociologists N.Hauw and U.Straus, on the basis of the study of the values of the middle class, come to the following conclusion: the most important factors that determine the thinking and actions of generations are not age, but the environment in which a person grew up and the norms of upbringing in the family, that is, the historical period of maturation [5].

The G.Alpatova, T.Semenikhina believes that only the generality of experiences and experiences creates an ideological, psychological and moral image of the "generation". But in their opinion, the middle class has not yet formed in the country. Therefore, the authors, analyzing the Russian case, propose to focus on the differentiation of generations of the most typical representatives of different ages [6].

An important aspect of the problem of determining the criteria for generation differentiation is the determination of parameters. The parameters of such criteria as the social role in the family and the historical period are more clearly defined. The agreement is less observed on the age parameters of the generation.

Many authors argue that the division of generations into three parts according to their role in the family is widespread: grandmother (grandfather), mother (father), children (grandchildren) [7]. It should be noted that the analysis of family roles in psychology is mainly aimed at studying the problem of generational interaction.

V.Pitshik noted that, for example, the period of socialism in Russia was replaced by the post-Soviet period, as a result of which the socio-cultural context changed. In his research, the author considers three generations of modern Russia: Soviet, post-Soviet and transitional [8].

Yu. Levada in the history of Russia, he identified the following turning points: 1905-1930-years-revolutionary turning point; 1930-1941 – years-the system of mobilization “Stalin”; 1941-1953-Years – War and post-war periods; 1953-1964 — years - “warmth"; 1964-1985-years - ” stagnation"; 1985-1999-years - " reconstruction”[9]. M.Postnikova adds another historical period to this classification — the period of Economic Stabilization. In modern Russia, as a result of the use of this typology, five generations are distinguished: pre-war and military; generation “Sixties”, generation “stagnation”; Generation “restructuring”; generation of post-Soviet; generation of Putin's stabilization.

Many questions arise when analyzing the parameters of the object criterion of generational differentiation. In modern age psychology, there are different approaches to determining the periods of development of age and their boundaries. Summarizing the local views on the division of development into periods, the following objects can be distinguished: childhood, adolescence (youth), puberty (maturity), old age.

Research Methodology. Within the framework of empirical research, the criterion for identifying a person with this or that generation, in our opinion, is important. In education, not only young, family, cultural and historical conditions are important. In the study of generations, the issue of the separation of the values of their generation by man occupies a special place. This question can be clarified by studying with which generation a person equates himself, with which generation he accepts values.

Thus, it can be concluded that the problem of generational differentiation is associated with the lack of unity of views on the definition of the number of criteria and the criteria that make up the system. The issues of determining the parameters of each of the three criteria (historical period, age and family role), which are often mentioned, have also not been adequately worked out. Such a variety of opinions makes the process of comparing the results of various studies difficult.

The problem of generations is that to date, a certain level of study is being carried out, which means that the following group of dependent people is increasingly clearly manifested:

1) the existence of a high level of demand for the study of generations in modern society and the lack of adequate study of this problem;

2) many indicators of the need to take into account socio-psychological characteristics in the practice of interaction between people and the absence of fundamental research of these characteristics.

Therefore, based on the above-mentioned views on the criteria for the differentiation of generations and their parameters, it was tried to determine the total cross-section of the main generation rows in Russia.

Currently, the most active in society are three generations, which can be divided into Soviet, transitional and post-Soviet generations in terms of the historical period of their maturation. In terms of age, the following periods of development are suitable for

these generations: fertility, youth and maturity. Family roles performed by different generations can be divided into: children, fathers (mothers), grandmothers (grandmothers)[10].

Analysis and results. The descendants of grandmothers and grandmothers are people who were brought up during the Times of the former Union. This generation, indeed, manages the society, organizes it, stabilizes it, shares experience and achievements, develops as a carrier of established traditions, relations and moral norms, determines its (this generation) great positive potential and significant efficiency. Being brought up in old relationships and customs, they at the same time break these traditions, taking advantage of the new knowledge and new opportunities that exist, saying goodbye to them, mastering new forms and methods.

The generation of parents is made up of young people who grew up during the transition period (periods of restructuring). At present, these people have reached the age of 25-39 years. This generation is characterized by the greatest: from observance of the inertia moment, which ensures the preservation of existing structures, to the active transition from the radical to the formation of new ones.

The generation of children is represented by girls and children who were born and grew up after 1990 years. They are characterized by maximum mobility and readiness for a new relationship. People between the ages of 17 and 25 are in search, using the experience of the older generations, choosing the most important things, but adhering to the new principles of life, trying to understand the truth more actively. The A.Litvinova believes that this generation performs the function of an invigorating mediator in social life.

Conclusion/Recommendations. In conclusion, the solution of these problems can be realized by building a complex socio-psychological concept of generations, within which the generation is considered as an autonomous social community, united by a common cultural and historical localization and, accordingly, a common experience.

Thus, the analysis showed that in the study of generations, researchers inevitably encounter a number of problems, this can be demonstrated as follows:

1. The problem of determining the concept of" generation";

2. The problem of determining the quantitative and qualitative characteristics of the offspring;

3. The problem of the differentiation of generations, it is divided into the problems of the parameters that distinguish the criteria and distinguish the generations.

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THEORETICAL FUNDAMENTALS OF HEALTH DIRECTLY DEVELOPING CHILDREN BY MUSIC EDUCATION

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Annotasiya: Maqolada imkoniyati cheklangan, nogironligi bor va rivojlanishdan ortda qolgan bolalarni sog‘lomlashtirishning nazariy asoslari, pedagogik-psixologik xususiyatlari, ularni faol shaxslar sifatida jamiyatda o‘z o‘rniga ega bo‘lishlarini ta'minlashda ta'lim-tarbiya tizimining ahamiyati, mazkur jarayonda musiqa ta'limi imkoniyatlaridan samarali foydalanish zarurati, uning pedagoik komponetlari tizimi va bosqichlari tadqiq qilingan.

Kalit so‘zlar: bolalar, nogironlik, imkoniyat cheklangan bolalar, rivojlanishdan ortda qolish, ta'lim, musiqa ta'limi, maxsus pedagogika, komponent, bosqich, faol shaxs.

Аннотация: теоретические основы реабилитации детей с ограниченными возможностями, педагогические и психологические особенности, роль системы образования в обеспечении их места в обществе как активных личностей, необходимость эффективного использования возможностей музыкального образования в этом процессе, его педагогическая система компонентов и фазы были исследованы.

Ключевые слова: дети, дети с ограниченными возможностями, дети с ограниченными возможностями, отставание в развитии, образование, музыкальное образование, специальная педагогика, компонент, этап, активный человек.

Abstract: The article explores the theoretical foundations, pedagogical and psychological features of the rehabilitation of children with disabilities, developmental disabilities, the role of the education system in ensuring their place in society as active individuals.

Keywords: children, children with disabilities, children with disabilities, developmental delays, education, music education, special pedagogy, component, stage, active person.

Introduction: Music has a global influence on the spiritual development of society compared to other forms of art. The First President of the Republic of Uzbekistan I.A. Karimov emphasized this, saying, “The sounds of music, no matter what nation or nation they represent, express the most noble, lofty and delicate human experiences . Most importantly, today the art of music is in the spirit of our young generation. It has a greater and stronger influence on the perfection of other forms of art ” [1:140 b].

Although medicine opens new horizons for the rehabilitation of children with developmental disabilities in our society due to the socio-environmental factors identified in our time, but the problem has not been fully resolved.

Literature review: Described by the American scientist G. Hawzer as “the sun of world medicine”, Abu Ali Ibn Sino, the master of world medicine, said that it is permissible to use not only medicine but also music in such matters. It is no coincidence that the book “Music Collection” emphasizes the whole chapter of the book “An-Najod” by dedicating it to the connection between music and the vascular war. Therefore, the burden of globalization, such as the rehabilitation of children with developmental disabilities, on medicine alone, leads to the conclusion that we are not making wise use of the opportunities available to us.

However, a child who grows up in a special school is more likely to experience some complications in the process of later adaptation to modern life. Due to discrimination in the labor market due to disability and the fact that many new jobs are not suitable for children who are “unique”, their choice of profession after graduating from boarding schools is already limited. In order to prevent such complications, it has become a socio-pedagogical necessity to bring up the above students as well-rounded people through the art of music and education. President of the Republic of Uzbekistan As Sh. Mirziyoyev noted, “The art of music as a cultural phenomenon has endless opportunities to educate and bring up a new generation”. [2:344 b]

Research Methodology: Although the development of social activism skills of children with developmental disabilities in music and art schools through music education has been identified as an urgent social pedagogical task, a new approach to ensuring this task is expected to change for the better in 2016. In this regard, the adoption of the Resolution of the President of the Republic of Uzbekistan dated November 20, 2015 No PP-2435 “On the State Program for further improvement of children's music and art schools for 2016-2020” was of great importance. As a result, 136 children’s music and art schools were commissioned and 142 were reconstructed and put into operation throughout the country. However, the existing experience and potential in this area is not sufficient. It is hoped that in the conditions of the new

Uzbekistan there is an opportunity to take a deeper look at such problems and solve them.

Currently, there are about 320 children's music and art schools in the country. If we look at the general statistics, taking into account the population density of each UNHCR, at least 250 young people are trained in music. Their total number averages 80,000. Of course, we cannot say that all of them connect their next life with the art of music on a professional level. The educational content and purpose of UNICEF is also not to train its graduates to be artists at 100% performance. But parents of students studying at UNICEF bring almost 80% of their children to UNICEF with the desire to raise them as artists in the future. The reason is that our people have a worldview that discriminates against music as an entertainment program. For this reason, in the eyes of the people, we need to use the base of children's music and art schools as a bridge in the rise of music science from the concept of "entertainment program" to the concept of “science”.

Indeed, music education acquires diplomatic qualities such as perseverance, will, strong memory, abstract thinking, clear thinking, intelligence, fluency of speech, eloquence, mutual exchange of ideas as a result of achieving equal formation of both hemispheres of the brain. It is necessary to make full use of the potential of children's music and art schools operating in the country.

Analysis and results: Also on the medical chart are children with mental, physical, intellectual development suffering from diseases such as BTsF (mild stage), speech retardation ZPR, children with speech problems, acute hypoxia complications, mild stages of pediatric autism, nervous system diseases, pediatric neurosis there is a need to create an experimental curriculum for children with disabilities on the basis of music and art schools.

“Music therapy” has been used effectively in foreign countries for many years. In the selection of musical works can be used electropuncture tests, taking into account the level of musical education of the person undergoing a course of music therapy, the characteristics of musical adequacy. In cases where hypofunction syndrome is detected, it is necessary to try to trigger the meridian point, and with hyperfunction syndrome - to bring the sedative to tone. The choice of solitary instruments is made taking into account the diagnosis of the meridian on the basis of the table: [3:16 b].

5 main elements	5 chjan organs (dense)	5 fu bodies (hollow)	Musical instrument
Tree	Liver	Grass bag	Xylophone, goboy, flute, clarinet
Fire	Heart	Small intestine	Guitar, violin, lyre, cello;
Earth	Black hair	Stomach	Flute, vocals;
Metal	Lungs	Fat intestine	Flute, saxophone, strings;
Water	Kidneys	Urine sac	Drums, tanburin, litavras;

Centuries before the American and Swedish schools of music practice were established in the world, Abu Ali ibn Sino, the source of medical science, promoted the use of music as a source of healing in practice through the makoms, which are the basis of our national professional music. In his “Laws of Medicine” encyclopedic book, “In the section on the human client”, the scholar explains which “maqom” [4:21 b] a person likes and which “maqom” can take the human soul to the heavens and achieve

the opposite results. emphasizes that he used his skills to drive the madman crazy and share healing with the insane through his tone.

Conclusion: In conclusion, the all-round development of a child with developmental delays makes life easier and more beautiful not only for himself but also for his loved ones. Additional education, ie BMSMs, can provide the necessary teaching methods, ie individualized education and an individual approach to the rehabilitation of children with developmental disabilities, depending on their age and health problems. The reason is that the child is not required to adapt to the existing system, on the contrary, the system is subject to him only and only according to his abilities.

Algorithmization of pedagogical activity in a musical-pedagogical environment, taking into account the varied application of individual-oriented pedagogical methods, including the temperament, character, method of communication of the pupil, is a difficult task. [5:100 b]

The inclusion of different wishes and desires of all students, taking into account their individual capabilities, constitutes "inclusiveness".

References to the pedagogical and psychological literature show that these modern methods of music education are based on certain criteria:

- technological, ie the comparison of the method with pedagogical technologies, in particular, the transition from the current explanatory-applied technology to the developing, problematic, person-centered technologies [7];

- Psychological - in the study of large-scale musical works, methods should be important in terms of youth psychology. I.S. Conn emphasizes two important aspects of this. [6:194 b]

Recommendations: The 8,000 teachers working in children's music and art schools in the country should pay special attention to the following in the process of music education for underdeveloped students:

1) art should help to realize the needs and opportunities of a student with disabilities, even if it is in his imagination;

2) to take into account the "group affect" - to help to be "like everyone else", that is, to choose methods that help students with disabilities in functional development, self-development, finding their place in society;

In the process of work, the education of a child with disabilities faces a number of problems with the technical apparatus, that is, in his hands. The reason is that such children are constantly observed mainly high or low muscle tone, neurological problems and disorders of fine motor skills. In such cases, it is necessary to include finger gymnastics in the training process in order to facilitate the mastery of the instrument. Finger exercises can vary.

Types:

1. Pull the fingers to the center of the palm one at a time and return them to their original position using stroking motions.

2. Bend the fingers alternately from the second system to the palm side at right angles.

3. Hands on the table. Raise each finger as high as possible in turn.

4. “Step” on a pair of fingers 2 - 3, 3 -4, 4-5 and so on

5. Rotate the wrist part of the hand first to the right and then to the opposite side.

Inclusive education is a very complex and ongoing process that recognizes the uniqueness and fitness of all children in need of social protection, and is a guarantee of the child's confidence in himself and those around him.

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MODERN PROBLEMS OF PHILOLOGY AND LINGUISTICS

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JADID LITERATURE OF THE INDEPENDENCE PERIOD AND THE ROLE OF BEGALI KASIMOV'S SCIENTIFIC SCHOOL

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Annotatsiya. Maqolada jadid adabiyotshunosligiga munosib hissa qo’shgan olim Begali Qosimov yaratgan ilmiy maktab va uning istiqlol davri jadid adabiyotshunosligida tutgan o’rni yoritib berilgan. Olim jadid adabiyoti namoyondalari ijodini chuqur tahlil va tadqiq etib, bu davr adabiyotining yangicha ruhini kashf etgan.

Kalit so’zlar: jadid adabiyotshunosligi, ilmiy maktab, an’anaviy adabiyot, jadid adabiyoti, turkchilik ildizlari, milliyat.

Аннотация. В статье описывается научная школа, созданная ученым Бегали Касимовым, внесшим достойный вклад в современную литературу, и ее роль в современной литературе периода независимости. Ученый глубоко проанализировал и изучил творчество представителей современной литературы и открыл для себя новый дух литературы этого периода.

Ключевые слова: джадидская литература, научная школа, традиционная литература, джадидская литература, турецкие корни, национальность.

Abstract. The article describes the scientific school created by the scientist Begali Kasimov, who made a worthy contribution to modern literature, and its role in modern literature of the independence period. The scientist deeply analyzed and studied the works of the representatives of modern literature and discovered a new spirit of the literature of this period.

Key words: jadid literature, scientific school, traditional literature, jadid literature, Turkish roots, nationality.

Introduction. Begali Kasimov, a hard-working scholar who made a worthy contribution to the development of jadid literature, as a scholar of jadid literature, carefully studied the heritage of hundreds of dedicated artists of this period. Literary critic B.Kasimov was a selfless scientist who devoted his whole life to the development of the nation's literature. He was born in an educated family in the village of Denov, Kasbi district of Kashkadarya oasis. The Kashkadarya oasis has brought up many creative and enlightened people to the Uzbek people.

Literature review. Under the leadership of professor Gulom Karimov, the aim is to study the Jadid movement and its representatives, which was dangerous for that period. Most importantly, with his effective scientific activity, he managed to open new paths for the history of our nation, for the history of our literature, unexplored reserves ... [2], points out that the scientific heritage created by the scientist in modern literature has reached the level of a school.

"They live in the hearts of the people", "To be the world within the world", "Enlightenment of the awakened nation", "Ismailbek Gaspirinsky and Mahmudkhoja Behbudi", "Enlightenment and the national awakening movement", "Truth as clear as the sun", "Two created by Professor B. Kasimov", "Two Destiny ",“ Tavallo and Haji Muin ",“ A Novel about Cholpon ”assesses the writers and poets who contributed to the revival of the Uzbek national thought. The literature of this period is truly new literature. “It differs drastically from the traditional form of literature, to the content, to the means of expression. It is a literature that awakened the nation and led to independence. [3]

Research Methodology. Begali Kasimov a hard-working scholar who made a worthy contribution to the development of modern literature, was a scholar of modern literature. Hundreds of dedicated artists of this period carefully studied the heritage and gave life to their dead souls. In the words of the Hero of Uzbekistan, literary critic Ozod Sharafiddinov, the phrase "The Last Jadid" suited him very well, a jadid scholar, is recognized as a meticulous researcher who studied in depth the participants in a major social movement called Jadidism and their activities. “It differs drastically from the traditional form of literature, to the content, to the means of expression. It is the literature that awakened the nation and led to independence. ”[3]

Analysis and results. Jadid literature is a new literature in its own right and serves as a basic school for the manifestation of rare talents in the history of Uzbek literature. Begali Kasimov studied the scientific school of jadid literature and devoted his dissertation to the work of Mirmukhsin Shermuhammedov (the most advanced representative of the jadids - Fikriy).

Due to the political situation, the Uzbek literature of the period of national revival began to be studied under the pretext of "revolutionary literature". After all, the time was very complicated and controversial. Whatever the virtue of the nation, whatever the light in its life, would be spread in the honor of the revolution. This desire has opened the door to new opportunities in the study of modern literature. ” [5]

Due to the fruitful work of this team, about twenty Jadid artists, including M.Shermuhammedov, Ismailbek Gaspirinsky, Abdulla Avloni, Behbudi, Fitrat,

Cholpon, Abdulla Qodiri, Tavallo, Sirojiddin Sidqi, Abdulhamid Majidi, Sofizoda, Ibrat, Ajzi, Haji Muin, Vadud Mahmud The literary heritage and socio-political activities of modern artists such as Mahmud have been extensively studied and included in school and university textbooks. Before independence, such scholars as N.Karimov, B.Kasimov, E.Karimov, A.Aliev studied modern literature, but after independence this line expanded considerably. O.Sharafiddinov, U.Normatov, N.Karimov, B. Nazarov, H. Boltaboev, D.Quronov, Sh.Rizaev, B.Karimov, I.G'aniev, N.Afoqova, U.Jurakulov and M.Tadjibayeva studied modern literature without ideological pressure. Among these researches the scientific heritage of Begali Kasimov has a special significance and serves as a source for creation of some researches on modern literature.

B. Kasimov's scientific school became the basis for new scientific directions in the field of literature and related fields. In particular, Jadid literature (H.Boltaboev, B.Karimov, I.Ganiev, U.Jurakulov), jadid drama (Sh.Rizaev, U.Saidov), jadid pedagogy (U.Dolimov), jadid press (B.Dustqoraev, H.Saidov) new enlightenment and jadidism (N.Jabborov), jadid historiography (S.Kholboev), jadid poetry (N.Afokova), classical literary traditions and mastery in the works of jadid writers (M.Tadjibayeva). In addition, in 2002, Turkish researcher Fatma Açık and in 2008 Tursun Kurban from China defended their dissertations on the literature of this period. All this is evidence of the fact that the literature of the Uzbek national renaissance was recognized among the masterpieces of world literature, as well as the school created by Professor B.Kasimov in the international arena.

After all, literature does not choose a nation. It is a reflection of the universal feelings created in the history of mankind. Its subject is Man, the object of study is a work of art, and the scientist who studies it remains a literary researcher. As a result, the use of the ideas and comments of the scientist in his research on modern science, which ensured the scientificity and perfection of the project, and it is appropriate to recognize it as a scientific school.

Professor B.Kasimov, studying the literature of this period, not only as a literary scholar, but also expresses an objective attitude to socio-political and economic processes. proves that he is a scientist. Literary scholar Kazakboy Yuldashev assessed the scholar's research as follows: Begali Kasimov, a scholar of the literature of the National Awakening, lived in a very difficult period in his works such as "Fitrat", "I was resurrected for you, mother!", "Fighter for Independence" with his consistent and logical conclusions about the works of modern Jadid writers, he made a significant contribution to clarifying the truth about the roots of Turkism and the stages of the formation of a sense of nationhood.”[4] Indeed, studying only the ideological and artistic features of Fitrat's poetry, the poet's "grassy poems" are not limited to the grief of the homeland, the suffering of the country and their connection to the social system, but also to the artistic charm, aesthetic function, poem construction, rhyme and weight. will be discussed separately.

Jadid literature distinguishes Jadid creators who have maintained the transparency of classical literature as a newly emerging phenomenon. He was one of the first to show the image of a nightingale and a flower in our classical literature, tyranny and the blood of the liver is the flower of the suffering Turkestan ”[3]. Also, continuing the artistic

interpretation of traditional images in Avloni's poetry, B.Kasimov noted for the first time that "in his ghazals the images of yor, ashik, gul, bulbul, agyor are reflected in a new spirit and in a new sense" [5]. His research is dominated by the revolutionary mood typical of the Jadids. This mood is especially evident in his books "Mirmukhsin Shermuhammedov", "Abdulla Avloni", “Izlay-izlay topganim,” “Marifat dargalari,” "Maslakdoshlar", "National awakening: courage, enlightenment, devotion".

Independence has led to great achievements in the study of Uzbek literature, has allowed to study the modern literature, to interpret the works in an objective, convincing, scientific way. Professor B.Kasimov is a well-known literary scholar who has deeply analyzed and interpreted the literature of this period on the basis of the ideology of national independence. Begali Kasimov is a scientist with a bright creative horizon and a potential critic. His scientific range is wide, not only in the works of Uzbek critics and writers, but also in the works of world literary critics and artists. The scholar's works on Belinsky's work, German scholar Ingeborg Baldauf's works, Tatar writer Shihobiddin Marjani's literary ties with brotherly Turkish literature, such as Sadiq Turol and Javod Hayat, testify to the role of Uzbek critics in the development of world aesthetic thinking.

B. Kasimov's in-depth scientific and theoretical research on the development of modern literature is of great importance. In 1995, together with Professor Nasimkhan Rakhmonov, he co-authored textbooks on "History of the Turkic Peoples" and "Literature of the Turkic World" in Turkey with experts from Kazakhstan, Kyrgyzstan, Turkmenistan, Azerbaijan and Turkey and cooperation with scientific centers, the international recognition of the scientific school created by the scientist, the fact that in 2002 the Turkish researcher Fatma Açık and in 2008 the Chinese Tursun Qurbon defended their dissertations on the literature of this period is another proof that the scientist created a real scientific school.

Among the scholar's analyzes and researches, another important aspect of his as a critic stands out. While the Russian literary critic V.G.Belinsky focuses on one feature that is necessary for a critic, this aspect does not bypass the work of Begali Kasimov. “A certain opportunity to understand the poet is to immerse himself in his soul: to see with the eyes, to hear with the ears, to speak with the tongue. It is impossible to study Byron without being a Byronist with the whole being. The same can be said of Goethe and Schiller. Of course, voluntary surrender to one's influence is still a calm, consistent, sincere, passionate, warm-hearted interest. The transformation of the wave of emotions into a concept beyond the reach of the mind is a constant step towards the study of the poet's work. "[6] Begali Kasimov's research on the works of Uzbek jadid literature confirms that he has a real Jadid spirituality. Well-known literary scholar Ozod Sharafiddinov does not call Begali Kasimov "the last serious" in vain. He lived and created in a serious style.

Conclusion. In conclusion, it should be noted that the scientific school created by Begali Kasimov is an important stage in the development of modern jadid literature and his fundamental views on Jadids play a special role in the development of Uzbek literature. The study of the scientific activity of the jadids, the scientific literature created by the scientist in the transmission of their spiritual and enlightenment heritage

to the younger generation allows for a deeper penetration and analysis of the science of jadid literature.

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THE ROLE OF LINGUOPOETICS IN THE POETRY OF OMAN MATJON AND LINGUPOETIC CHARACTERISTICS OF SIMILARITIES

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Annotatsiya. Ushbu maqolada Omon Matjon she`riyatida lingvopoetikaning o`rni va o‘xshatishlarning lingvopoetik xususiyatlari to`g`risida so`z yuritilgan. Hozirgi kunda badiiy asar tili, badiiy asar nutqining individual xususiyatlarini o’rganishda hamda badiiy asarni lingvopoetik tadqiq qilishga alohida e’tibor berilmoqda.

**Kalit so`zlar:** she`riyat, lingvopoetika, shoir, ijodkor, tilshunoslik, lirika, obrazlilik, o‘xshatish, lirik qahramon, tilshunoslik, badiiy matn, nutq, personaj.

Аннотация. В статье обсуждается роль лингвопоэтики в поэзии Омона Матжона и лингвопоэтические особенности аналогий. В настоящее время особое внимание уделяется изучению языка художественного произведения, индивидуальных особенностей речи художественного произведения, а также лингвопоэтическому изучению художественного произведения.

Ключевые слова: поэзия, лингвопоэтика, поэт, творец, языкознание, лирика, образность, аналогия, лирический герой, языкознание, художественный текст, речь, персонаж.

Abstract. This article discusses the role of linguopoetics in the poetry of Omon Matjon and the linguopoetic features of analogies. Nowadays, special attention is paid to the study of the language of the work of art, the individual features of the speech of the work of art, as well as the linguopoetic study of the work of art.

Key words: poetry, linguopoetics, poet, creator, linguistics, lyric, figurative, analogy, lyrical hero, linguistics, literary text, speech, character.

Introduction. We know from the history of Uzbek poetry that each poet's work is a school of skill. The creative maturity of any writer or poet depends, first of all, on his devotion to national ideas and values and his ability to express them poetically in his work.[2] Since the main element of a work of art is the word, in general, the language is a key factor in the ability of the author to use the means of language in order for this work to rise to the level of true art. The study of the language of any creative work that has left its mark on our literature stems, first, from the skill of the writer, but also from the need to clearly define the influence of the language of his works on the development of our language. Modern Uzbek literature, in particular, poetry, has a significant impact on the spiritual and educational development of our society. In recent years, special attention has been paid to the study of the language of the work of art, the individual features of the speech of the work of art, and the linguopoetic study of the work of art.

Literature review. Thanks to the centuries-old hard work of our people, who are the main creators of oral and written literature, scholars, intellectuals and writers in the Uzbek literary language, they have a special place in the Turkic language family. Many immortal works of art and scientific research have been created in the Uzbek language. This also ensured that the Uzbek language was included in the layer of cultural languages.[1]

As you know, it is difficult to imagine art, especially poetic speech, without linguopoetic means. One of the linguistic-poetic means of figurativeness, which provides the emotional-expressiveness of the language of poetic texts, is analogy. Literary texts, which are the product of human creativity, serve as material for linguopoetic analysis. Of course, outside of the text, by analyzing a particular word or phrase, the artist’s distinctive style cannot be distinguished from the lyrical heroes or characters involved in the poetic text he or she creates. At the heart of the analogies is the author's communicative purpose, his attitude to the facts of reality, his desire to evaluate them on the basis of linguistic and non-linguistic factors.[4]

Research Methodology. In our language, “muzday suv”, “qo‘yday yuvosh”, “toshday qattiq”, “paxtaday yumshoq”, “cho‘chqaday semiz”, “tulkiday ayyor”, “terakday uzun” which are often found in various forms of speech, especially in oral and artistic speech and in part in journalistic texts. A number of metaphors, such as “cho‘chqaday semiz”, “tulkiday ayyor”, “terakday uzun” are often used in our speech, and are limited to the interpretation of a certain quality of the image object. 'frozen. They are the traditional analogies of today. Literary texts, on the other hand, acquire poetic value at the expense of unexpected means that have a strong effect on the reader's psyche and create imagery. In our language, there are two types of analogies: 1) individual-author analogies or free analogies 2) universal or fixed (permanent) analogies. Free analogies in terms of artistic and aesthetic value, linguopoetic weight,

have a special place in artistic speech as one of the means of demonstrating the skill of the writer.[2]

Analysis and results. The writer creates a variety of original parables in accordance with the purpose of his artistic image, these parables captivate the reader with their unexpectedness and difficulty, certain mental or physical state-feature-objects are clearly visible to the reader embodies." The metaphors used in Omon Matjon's poetry attract the reader with their uniqueness and charm. This shows that the poet is well aware of the hidden potential of our language, the means of creating analogies.[6]

As you know, our language has lexical and grammatical devices that create similarities. Lexical means such kabi, singari, qadar, yanglig‘, bamisoli, bamisli, misoli, misli, monand, xuddi, naq, go‘yo, teng, o‘xshatmoq, eslatmoq, demoq, bo‘lmoq, bir, aynan, o‘zi, tus, ibrat, holatda, chu, andoqki etc., grammatical devices -day (-dek) -dak -(tak) -dag‘ (-dog‘) -dayin, -dan, -dir, -namo, - simon,- ona, -omuz, -li, -cha, (-larcha, -chalik, -chasiga).

The following example of a poetic image can be seen in the poet's poem, which involves the use of such means as ***-dek, -day, -yanglig.*** As we read the poem, we see a lyrical hero who is first intoxicated with love and then suffering from exile. Here is the first case:

Boshqalardek sevishdik biz ham,
Kuyib yurdik boshqalar kabi.
Bu savdoni baxt bildik biz ham,
Baxtdir, dedik visol, yor labi.[3]

First of all, the choice of the units on which the analogy is based, the comparison of the young man's life with sadness and saffron, leaving the joy and the parity's life with grief, bring some sadness to the reader's heart, points to experiences. This content is reinforced by the lexeme ***"dek",*** which creates an analogy in the following verses. Omon Matjon creates an unexpected imagery through the lexeme ***"dek",*** which creates an analogy, so that the reader involuntarily begins to think about the depicted object, looking at its form and content through the eyes of a lyrical protagonist.

Boshqalardek duch kelib qolsak,
Olislardik ming bor hayrilib.
Mana, biz ham bebaxt, beharsak
Boshqalardek ketdik ayrilib.[3]

Such a revelation of the human state of mind can be said to be unique to the method of Omon Matjon. "Individuality is defined by the art of word choice in a writer's creative process. This, in turn, reflects the writer's linguistic personality, that is, his artistic thinking, his personal perception, and his linguistic ability. In particular, the concept of individual style becomes clearer when the language of an author's works is studied comparatively with the language of contemporary creative works.

Because in the style of the writer, all the means of language used aesthetically by the artist are united on the basis of an internal connection with his artistic thinking, "can be applied to the poetry of Omon Matjon. The unique image created by the means of simulation described above" is a way to excite a person spiritually, to make him cry, to make him laugh, to lead him to a fantasy world, to make him think, to form his

aesthetic thinking, to look at events in a different way. It has many possibilities, such as teaching, which shows the wide range of linguistic and poetic possibilities of the literary text. A true poet can transmit his mood and experiences to others. The same situation is felt in the poems of Omon Matjon. As we read each poem, we are unknowingly affected by the emotions expressed by the poet. Because the poet is well acquainted with the spiritual world of poets. He finds and speaks a word that touches his heart. Even when he speaks, he speaks in a way that disturbs the spirit that shakes the student's body.[7]

We know very well that a lot has been said and is still being said about the power of the nation, its greatness, the need to improve its life. But the people are made up of ordinary people, including the noble and the great and the lowly and the deceitful, so instead of deifying and sanctifying the people, it is necessary to raise their spiritual level.

In his poems, the poet's great sufferings and heartaches are vividly reflected. Looking at the sharply critical spirit of the poem, one should not go to the misconception that Omon Matjon does not love his people. The poet loves his people. She cares about her future. That's why he wants to see it flawless, great. While this reason is unpleasant, he can tell his people the truth. The human courage and artistic charm of the poet's poem, which begins in the Soviet era and begins with "Which year is in the spring ...", amazes. At that time, the poet predicted the destruction of the land where the cranes could not find a place to land, the name of the river Jayhundai Asov remained in the legends, and even destroyed the graves and did not hesitate to plant crops, leaving no mercy for the children of this country. The poet expresses his thoughts in a very beautiful way. [5]

In these verses the position of the cranes is very clearly, impressively and accurately reflected. The reason for the slow flight is that the cranes are coming from the far south, and for a long time they have been wandering in search of a place to land due to fatigue. The situation is realistic and convincing. In the poem "Song" the situation of a lover who has lost his life due to the enmity of the wicked is expressed very tenderly. Although the lover is not directly depicted in the poem, through the eyes of the lover, the image of the girl with tears in her eyes due to the separation, the teeth are brighter than anyone else's beauty, appears in the poet's imagination. She joins the lover and falls in love with this beauty.

Conclusion. Omon Matjon uses the vocabulary of the Khorezm oasis, the legends of that country, the sweet words of the people of the oasis. The poet often refers to folk art. That is why his poems are easy to read, have a strong impact on people and are immediately remembered. Reading and memorizing the poems of the poet with love and care is important in the formation of your spirituality. These poems will guide you to think more seriously about life, people, their inner world, to draw your own conclusions.[8]

The words of the President of the Republic of Uzbekistan Sh.M.Mirziyoyev: "... we always acknowledge with gratitude the great contribution of cultural figures in the spiritual development of our people", in our opinion, fully applies to the people of the pen. Therefore, the emergence of new interpretations of the works of Omon Matjon among the representatives of the Uzbek poetry of the twentieth century, their

confirmation or denial, the escalation of debates on them can be considered a natural phenomenon in the world of science.

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A STUDY OF LINGUISTIC UNITS THAT EXPRESS BEHAVIOR IN ENGLISH AND UZBEK LANGUAGES

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Annotatsiya: Ushbu maqolada ingliz va o’zbek tillarida xulq-atvorni ifoda etuvchi frazeologik birliklarning badiiy adabiyotmiz va insoniyatimiz uchun ahamiyatli tomonlari, va har ikkala til uchun xos bo’lgan frazeologik iboralarning qiyosiy taxlil natijalarini tadbiq etish bilan bir qatorda, frazeologik iboralarning har qanday ijodiy ish namunalarida qo’llanilish tamoyillariga alohida ahamiyat berilgan.

Kalit so’zlar: ijodkorlik, yozuvchi, fraza, ekvivalent, mavzu, qiyoslash, stilistika, monografiya.

Аннотация: В статье исследуются важные для нашей литературы и человечества аспекты фразеологизмов выражающих поведение на английском и узбекском языках а также результаты сравнительного анализа фразеологизмов, характерных для обоих языков а также примеры фразеологических выражений в любом творческом произведении. Особое внимание уделяется принципам применения.

Ключевые слова: творчество, писатель, фраза, эквивалент, предмет, сравнение, стилистика, монография.

Abstract: This article examines that important aspects of phraseological units which expressing behavior in the English and Uzbek languages for our literature and humanity. As well as the results of a comparative analysis of specific phraseological

expressions to both languages, besides, special attention is paid to the principles application of phraseological expressions in any creative work.

Key words: creativity, writer, phrase, equivalent, stylistics, comparison, monograph.

Introduction. Nowadays the role of phraseological units, idioms, proverbs and aphorisms that express behavior in English and Uzbek is very important for both languages. Such genres include a long period, which was formed from ancient times to the present day. Phraseological phrases are one of the rarest heritage, which from ancestors to generations.

As we know, most phraseological phrases are based on any subject, not only to the subject of behavior, for example: friendship, courage, goodness and evil, etc. Firstly, so developing proverbs and phraseological units began to appear among people by telling orally. It is interesting that these linguistic units were not made under one name, they were told by native people. After some time, they are developing actually under only one name. Nowadays phraseological units which based on different languages are being placed as a rare work of our literature.

Literature review. If we emphasize the base of proverbs, idioms, and phraseological phrases: proverb - a wise inheritance that manifests the spiritual and moral, national spirit of the people, the nation in itself. They were formed mainly in the process of communication of people with each other. [1]

Fables, tales (matal) – the formation of speech composition that occur in a wide range of the language through different images of what is happening around us, and phenomena. [1,2]

During our analysis of proverbs, aphorisms, idioms and phraseological units, we encountered a lot of research works and expressed ideas of writers and scientists. Today on the above-mentioned topics lot of scientific research is being carried out by them. Many writers have used phraseological units on different themes with extensive skill their own creative samples. The founder of the science of phraseology is the famous Swedish scientist Charles Bally. The author introduced a special chapter sample, which consists of phraseological units, and described Ferdinand de Saussure`s “The features of the Syntagm” in his own work. [10]

Besides works of many scientists are devoted to analysis of phraseological units, for example: L. K Bayramova and M. F. Chernov. Over time, they learnt these units and carried out scientific research.

Nowadays various textbooks, manual books and monographs based on phraseological units are being published which written by many scientists. For instance, Sh. Rakhmatullayev's monograph “Some issues of Uzbek phraseology” is based on the introduction of lexical units of phraseological units in the language. After some times, requirement to the usage of phraseological units, proverbs, fables and idioms were developed. One of the Russian scientists, V. V. Vinogrodov disciplined the classification of Russian phrases to English phraseological units, besides he classified them into 3 groups:

1) Phraseological adaptations
2) Phraseological mixed
3) Phraseological compound

The dissertations of Sh. Rahmatullayev, G. A. Bayramov, G. X. Axunzyakov, L. K. Bayramova, M. F. Chernovs are based on a sample of phraseological units.

Research methodology. In the methodology of the study, it is mainly studied phraseological units which used in each creative work separately. As we know, phraseological idioms are based on many kind of themes. They have own roles in our speech, we cannot use one idiom instead of phraseological one, for example, we cannot use phraseological units of behavior instead of political idioms.

Although learning Russian and English phraseological compounds were begun to develop more years ago than so branch was researched Linguistics of the Uzbek language 40-70 years of last century. According to the point of view of science, based on modern analytical techniques, special attention is paid to the analytical results of phraseological phrases, which are suitable for both languages. During our analysis of proverbs and fables, we encountered different aspects of them, we touched on them separately on the following.

Analysis and results. As we all know, any phraseological units of the English and Uzbek languages differ sharply from each other according to their spiritual and structural aspects. We cannot translate phraseological units from Uzbek to English word by word because richness of words of the Uzbek language is on the first place in the world, that`s why there are not Uzbek words, idioms and phrases in English vocabulary. And we can see the opposite of this situation. However, some themes of phraseological units are available in both languages, for instance, behavior, friendship, braveness, shyness and others. Some differences of phraseological compounds which about behavior are given on the below:

- Politeness costs little, but yields much – the cost of being frankly is cheap, for being so does not need many things, but it gives much crop. “Yaxshi gap bilan ilon inidan chiqar, Sovuq-sovuq so’zlasang, qilich chiqar qinidan”.
- A fool says what he knows, and a wise knows what he says. – A stupid man tells anything, a clever man knows what to tell, not speak without thinking. “Dono o’ylab aytar, Nodon - o’ynab”.
- A sluggard takes a hundred steps because he would not take one in due time. – A lazy man has to go 100 steps because of not put 1 step on time. “Yalqov –o’ziga yov”
- A wise man hears one word and understand two. – A clever man understands two meanings by hearing one word. “Aqilliga bir so’z bas, Aqilsizga ming so’z oz”.

In spite of similarity of according to their meanings of above phraseological idioms, there are various phraseological ones on their structure and shape. For example, “A rotten apple spoils the barrel” (Tirriq qo’zi podani buzar), during analyzing this idiom we cannot understand the meaning. “A rotten apple” (chirigan olma = it means a person who has bad manners). “Manners make the man” in Uzbek “Manners earn reputation for man” (Insonni fazilatlar ulug’laydi). The meanings are the same in the given second example, but words are not the same.

Proverbs express the meaning of the sentence, they are made up matching words with rhythm and sounds. Antonym words are used very much in proverbs. Besides, it expresses a figurative meaning. Proverbs are not a simple sentence; they are a part of

the compound sentences. There is conclusion in proverbs, but there is not it in fables. Readers themselves conclude fables, according to their own outlook.

Fables are used in simple sentences with figurative meaning. We can change pronouns in fables, but we cannot in proverbs. They are stable. As we know, translating them word by word is difficult. For example, if we translate the idiom “As cool as cucumber” of the English language, it matches to the idiom “To’pig’iga suv chiqmas” of Uzbek. Actually, this idiom is used for a person who think about nothing.

By analyzing above the example, we translated them to Uzbek to compare stylistic meanings by using equivalents, but they are not similar in their meanings. We can understand some phrases by analyzing words.

Conclusion. According to given ideas, in conclusion we can say, requirement to the usage of proverbs, fables and phraseological in our speech is rising day by day, especially, the role of phrases of behavior are very necessary. You know that so phraseological idioms give positive influence to manner and spirit of people. Any readers can understand their own mistakes by hearing or using so idioms in daily life. They try to correct them. Because of effecting positive influence, main places and pages are given in newspapers and magazines. So that reason many kind of proverbs, fables and phraseological units are being appeared in our speech.

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INVESTIGATION OF THREATS TO THE SUSTAINABILITY AND SECURITY OF THE ENTREPRENEURSHIP SYSTEM WITH THE HELP OF THE QUESTIONNAIRE METHOD

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Annotatsiya: Ushbu maqolada sotsiologik so'rov asosida tadbirkorlikning iqtisodiy barqarorligi va xavfsizligiga asosiy ichki va tashqi tahdidlar o'rganildi va ularning ta'sir darajasi baholandi. Shuningdek, cheklangan iqtisodiy barqarorlik ko'rsatkichlari, tadbirkorlik barqarorligi va xavfsizligiga tahdidlarni bartaraf etish va ularning maqbul darajalari aniqlandi. Tadqiqot natijalari asosida tadbirkorlikning iqtisodiy barqarorligi va xavfsizligini ta'minlash bo'yicha xulosalar va tavsiyalar ishlab chiqildi.

Kalit so'zlar: Tadbirkorlik, tadbirkorlik tizimi, xavfsizlik, iqtisodiy barqarorlik, tahdid, ichki tahdid, tashqi tahdid.

Аннотация: В данной статье изучены основные внутренние и внешние угрозы экономической стабильности и безопасности предпринимательства на основе социологического опроса и оценен уровень их воздействия. А также определены показатели предельной экономической стабильности, устранения угроз стабильности и безопасности предпринимательства и их оптимальных уровней. По результатам исследования разработаны выводы и рекомендации по обеспечению экономической стабильности и безопасности предпринимательства.

Ключевые слова: предпринимательство, система предпринимательства, безопасность, экономическая стабильность, угроза, внутренняя угроза, внешняя угроза.

Abstract: In this paper learned the main internal and external threats to the economic stability and security of entrepreneurship based on a sociological survey and assessed their level of impact. As well as, identified indicators of marginal economic stability, elimination of threats to the stability and security of the entrepreneurship and their optimal levels. Based on the results of the research developed conclusions and recommendations to ensure the economic stability and security of entrepreneurship.

Keywords: Entrepreneurship, entrepreneurship system, security, economic stability, threat, internal threat, external threat.

Introduction Sustainability and security of entrepreneurship system operation, that is an important factor in condition of innovative development, is one of the most important and topical issues. The entrepreneurship system, which is one of the key factors in the development of the national economy seen as a starting point and a means

of addressing the diverse and sometimes conflicting issues that simultaneously require the stability of the economy, society and the environment. Indeed, entrepreneurship factor of market mechanism, its essence requires the need to accelerate growth of human capital, which represents the path of innovative development. In its place, the modern entrepreneurship system, being a factor in ensuring the stability and security of economic, social and environmental development, first requires, its development based on such principles.

The number of entrepreneur entities in the world today is very high in the share of operating enterprises; therefore, their share is becoming more weighty in gross domestic product and employment in the context of innovative development.

The share of the middle class in society, which is the basis of the entrepreneurial class, is also growing in developed and developing countries. In particular, the number of entrepreneur entities is more than 90 percent of the total number of enterprises in developed countries, accounts for 53-70 percent of GDP and 40-80 percent of working age population on average and they serve to ensure the development of the national economy and cohesion of society, ecological balance [13].

Fluctuations in economic and social development, especially global financial and economic crisis, COVID19 in the community, environmental problems in nature, number of contradictions related to scarcity and value of innovative technologies, efficient use of resources in production, unemployment and population migration play a critical role in ensuring economic security and sustainable development of the entrepreneurship system.

The study of systematic ways of forming effective, convenient mechanisms that allow the same interpretation of assessment of sustainable development and security of entrepreneurship system, as well as the creation of a management concept is a topical issue of scientific and practical importance. However, this complex problem does not have its own simple and clear solution.

Literature review. Systematic research plays an important role in ensuring the sustainable development and economic security of entrepreneurship, based on an evolutionary approach to business protection and institutional and factorial approaches to this issue. As a result, there is a growing interest in research on the role and importance of socio-economic categories of sustainability and security of entrepreneurship system. In several literatures the general concepts, types, classification of economic security [1], as well as the factors influencing economic security have been studied [6]. In recent economic researches paid great attention to the issues ensuring economic security [2] and direction of its provision [3]. Many researchers studying planning and evaluation of the effectiveness of entrepreneurship development programs based on the materials of foreign research [4].

At the current level of development, the problem of electronic espionage has become the subject of many studies in ensuring the safety of enterprises [5]. A number of studies have been conducted to study the various threats [7], risks [8] associated with the purpose of this industry, which need to be systematically studied, and to classify them by type [9], essential features and indicators [10,11] to form an information system [12]. As well as several authors dedicated their research work to the different branches of entrepreneurship security such as, Odyntsov, A. learned economic and

information security of entrepreneurship [14], Rudnichenko, Ye. Studied influence of subjects of customs regulation on the system of economic security of the enterprise [15], Lyasnikov, V.N., Frolova, E.E., Mamedov, A.A., Zinkovskii, B.S., Voikova, A.N. conducted research on the role of venture capital financing as a mechanism for impelling innovation activity [16]. Pavlov, A.Yu., Batova, V.N. learned economic security of business processes within the term of implementing the conception of sustainable development [17], Pozdeev, V.L. analyzed system of economic security [18] and others.

Research methodology. In the research used empirical and theoretical methods, sampling methods, questionnaire survey, data collection and processing, comparative analysis, logical analysis, structural analysis, statistical analysis.

Analysis and results. Considerable attention is paid to the systematic study of the stability and security of the entrepreneurship system in a market economy, the study of its consistent effects on economic, social and environmental aspects. The economic aspect of entrepreneurship system is a formation and development of competitive environment, creation of economic, organizational basis for its rapid transition to the path of innovative development in the growth of the national economy.

On the social side economic development “miracle” increase the solution of employment problems in country, formation of entrepreneurial class, formation and strengthening of the middle class, which is a socio-economic stabilizing force in society.

The ecological aspect requires the study of largest number of representatives of production system, large consumers of natural resources and various influences on environmental components, as well as a highly influential factor in health and lifestyle of population.

Starting to study these three interrelated and interdependent aspects of entrepreneurship system, of course, with the study and systematization of various threats and pressures on the development of this system, as well as the formation of a database on these issues will be reasonable and reliable by scientific-theoretical and methodological-practical. It cannot be said that carried out in-depth research on the conceptual foundations of the stability and security of the entrepreneurship system in this direction at the national, regional levels. Although a lot of research is being done at the enterprise level, the fact that entrepreneurship is not studied as a separate system does not correspond to its economic, social and environmental role and status.

These problems, especially in recent years, are of particular importance in learning systematically and comprehensive study, as well as formation of a database of business environment of developing countries, including Uzbekistan. Although the Khorezm region of the country is not high in terms of economic, social and resource potential, its population is characterized by entrepreneurial ability, mobility and a high number of entrepreneur entities per 1,000 people. In order to systematically study the stability and security of entrepreneurship system in this region, we conducted a sociological survey among entrepreneur entities based on the above scientific approaches. The survey consisted of a total of 74 questions in five economic, social and environmental areas, consisting of five sections.

When conducting a survey regional entrepreneur entities, was selected using the sampling method, taking into account such features as territorial location, organizational and legal form, areas of activity. A total of 300 questionnaires were distributed among the respondents, of which 251 were found to be fully completed and usable in the prescribed manner. Within the framework of the survey, internal and external threats to the economic security of sustainable development of the entrepreneurship system were studied and researched, and scientific-practical, recommendations and suggestions were received based on the indicators formed on these threats.

The basis of systemic measures to ensure the stability and security of the entrepreneurship system determined by the results of a group of indicators that assess them. Taking into account these aspects, analyzed main indicators representing the internal and external threats to the entrepreneurship system, and the following main results obtained at an example of Khorezm region.

First, given the importance of these issues, the classification of threats in the formation of indicators in the scientific-methodological part of the survey based on the work of foreign and Russian researchers. We used I.Belozerov's approach, which was able to create a perfect one, and formed the threat indicators of the survey [9]. Initially, we would like to focus on internal threats. For this purpose, six types of threats were made available to the respondents, and their impact was assessed on three different levels.

Table 1

What are the main internal threats to the economic stability and security of the enterprise and how do you assess their impact?
(You can select 4-5 variant)

Threats	Level of impact	Number of answers	Share %
1. Decrease in production capacity due to obsolescence of depreciated parts of fixed capital.	Low	16	7.9
	Moderate	167	82.3
	High	20	9.9
2. Technically and technologically backward	Low	37	19.7
	Moderate	109	58.0
	High	42	22.3
3.Production costs	Low	23	12.6
	Moderate	126	69.2
	High	33	18.1
4. Theft and fraud within the firm	Low	59	33.0
	Moderate	87	48.6
	High	33	18.4
5. Losses due to professional shortcomings of employees (human factor)	Low	30	16.5
	Moderate	123	67.6
	High	29	15.9
6. Receiving confidential information from company employees by competitors	Low	24	13.2
	Moderate	124	68.1

	High	34	18.7

The study found that all internal threats have an impact on the economic stability and security of entrepreneur entities and in all of them, the proportion of cases with a moderate level of impact is high. While the results of assessing the level of these threats as low ranged from 7.9% to 33.0%, the results of assessing as moderate and high ranged from 48.6-82.3 and 9.9-22.3%, respectively.

In order to study the impact of individual external threats, 10 types of threats and the views of respondents were assessed and generalized to measure the degree of their impact (Table 2).

Table 2

What are the main external threats to the economic stability and security of the enterprise and how do you assess their impact?
(You can select 4-5 variant)

Threats	Level of impact	Number of answers	Share %
1. Decline of its position in the market in sale of goods that enables the expansion of the firm	Low	23	10.6
	Moderate	172	78.9
	High	23	10.6
2. Deterioration of financial situation in country, in region	Low	42	22.5
	Moderate	118	63.1
	High	27	14.4
3. Decrease in the value of company's shares in stock market	Low	26	15.7
	Moderate	122	73.5
	High	18	10.8
4. Customer solvency	Low	33	19.1
	Moderate	111	64.2
	High	29	16.8
5. The dishonesty of competitors and intermediaries	Low	51	29.8
	Moderate	89	52.0
	High	31	18.1
6. Competitors' criminal behavior	Low	71	41.0
	Moderate	79	45.7
	High	23	13.3
7. Espionage in production	Low	62	36.0
	Moderate	91	52.9
	High	19	11.0
8. Weaknesses of state economic and criminal legislation	Low	52	31.0
	Moderate	95	56.5
	High	21	12.5
9. Crimes in the field of computer technology (hacking)	Low	69	42.1
	Moderate	83	50.6
	High	12	7.3

10. Raising the issue of production of new products	Low	32	20.4
	Moderate	104	66.2
	High	21	13.4

According to the results of the assessment of the level of exposure to external threats, the impact of computer technology on crime (hacking), criminal activity in competition, espionage in production, and weaknesses of state economic and criminal legislation is lower than others are. Found that the impact of competition and intermediary dishonesty, the solvency of buyers, the deterioration of financial situation in country and its regions is higher than others. In general, in assessment of external factors, the share of assessments as moderate in all of them is large, and their variability in risk section is slightly higher, for example the width of variation is 33.2 units.

Also, studied respondents' opinions on the analysis of boundary indicators of entrepreneur entities and their levels in the protection of economic security from internal and external threats at the required level of sustainable development of the entrepreneurship system (Table 3).

Table 3

What do you think about the marginal economic stability indicators and at what level they should be?
(You can select more than one)

Criteria	Level of impact	Number of answers	Share %
1. Ratio of estimated demand for the firm's product or production volume of the product to its production capacity	Low	20	9.9
	Moderate	164	81.2
	High	18	8.9
2. The share of innovative products in the total product of enterprise	Low	30	16.1
	Moderate	133	71.5
	High	23	12.4
3. Competitiveness of enterprise in domestic and foreign market of goods and services	Low	29	16.1
	Moderate	109	60.6
	High	42	23.3
4. The rate of depreciation of the enterprise's fixed assets	Low	48	25.9
	Moderate	112	60.5
	High	25	13.5
5. Product and asset efficiency	Low	33	17.7
	Moderate	117	62.9
	High	36	19.4
6. Availability of working capital	Low	33	17.2
	Moderate	130	67.7
	High	29	15.1
7. The number of employees in enterprise who earn less than the standard of living	Low	40	23.1
	Moderate	105	60.7
	High	28	16.2

Observed similar trend in all answers received on indicators of marginal economic stability, how their level should be in the firm, that is, proportion of responses should be moderate. In particular, the ratio of production volume to production capacity and estimated demand for enterprise's product should be moderate, 81.2 percent; the share of those who say that the rate of decay of fixed assets of enterprise should be moderate is 60.5%. Also, studied what are the indicators to eliminate threats to the stability and security of the firm and to what extent they should be (Table 4).

Table 4

What are the indicators to eliminate threats to the stability and security of enterprise, and at what level they should be?
(You can select more than one)

Criteria	Level of impact	Number of answers	Share %
1. Ensuring highly qualified employees at enterprise	Low	22	9.9
	Moderate	173	77.9
	High	27	12.2
2. Level of intellectual potential of employees	Low	9	4.8
	Moderate	142	75.1
	High	38	20.1
3. Ensuring technical and technological independence of the enterprise	Low	17	9.8
	Moderate	121	69.5
	High	36	20.7
4. Level of product competitiveness	Low	26	15.2
	Moderate	114	66.7
	High	31	18.1
5. Firm management coefficient level	Low	33	19.6
	Moderate	115	68.5
	High	20	11.9
6. Current liquidity ratio level	Low	35	20.6
	Moderate	105	61.8
	High	30	17.6
7. Capitalization ratio	Low	29	17.1
	Moderate	108	63.5
	High	33	19.4
8. Ensuring the level of environmental activity of enterprise	Low	28	16.9
	Moderate	116	69.9
	High	22	13.3
9. Ensuring legal protection of enterprise	Low	32	19.0
	Moderate	107	63.7
	High	29	17.3
10. Protection of enterprise information environment	Low	30	17.2
	Moderate	120	69.0
	High	24	13.8

11. Ensuring the safety of the enterprise's employees	Low	24	14.6
	Moderate	105	64.0
	High	35	21.3

According to the results obtained on the indicators and their level of elimination of threats to the stability and security of the enterprise, considered expedient to have all of them at a moderate level. This is because the share of the option that all answers should be moderate is over 60 percent.

At the same time high level of indicators such as level of highly qualified personnel (77,9), intellectual potential (75,1), technical and technological independence (69,5), product competitiveness (66,7), management coefficient (68,5), environmental activity (69,9) and information security (69,0) were considered to be the basis for its sustainable development and economic security in the enterprise's ability to withstand threats. The need for a enterprise with a high level of technical and technological, financial stability, competitiveness, organizational and human resources, which ensures the stable operation of enterprise in the direction of innovation, ensures enterprise's ability to withstand internal and external threats.

Conclusion. In general, in studying sustainable development of the entrepreneurship system of the region and economic security issues absence of complete information on the system of indicators required by the enterprise's official, financial and management reports, appropriate tactical and strategic measures are taken to ensure prompt and reliable information, effective development of the firm.

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IDENTIFICATION OF LIVESTOCK DEVELOPMENT DIRECTIONS AND FORECAST INDICATORS IN THE REGION

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Abstrakt. Mazkur maqolada Qoraqalpog‘iston Respublikasida chorvachilikni rivojlantirish tendensiyasi qarab chiqilgan. Chorvachilik mahsulotlarini ishlab chiqarish hajmi 1991-2020 yillar ma'lumotlari asosida 2025 yilga qadar prognoz qilingan. Olingan natijalar asosida chorvachilikni rivojlantirish bo‘yicha xulosa va takliflar ishlab chiqilgan.

Kalit so‘zlar: chorvachilik, qoramol, sigir, qo‘y, ot, go‘sht, sut, stasionarlik, “unit root” test, prognozlash, ARIMA model'.

Абстракт. В данной статье рассмотрены тенденции развития животноводства в Республике Каракалпакстан. Объем животноводства прогнозируется до 2025 года на основе данных за 1991-2020 годы. Разработаны выводы и рекомендации по развитию животноводства в регионе.

Ключевые слова: домашний скот, крупный рогатый скот, корова, овца, лошадь, мясо, молоко, стационар, “unit root” тест, прогнозирование, модель ARIMA,

Abstract. In this paper looked through the trends in the development of livestock in the Republic of Karakalpakstan. The volume of livestock production is forecasted until 2025 on the basis of data for 1991-2020. Developed conclusions and recommendations for the development of livestock in the region.

Key words: livestock, cattle, cow, sheep, horse, meat, milk, stationary, unit root test, forecasting, ARIMA model,

Introduction. Livestock breeding has deep historical roots and is one of the most promising areas in the development of agriculture in the Republic of Karakalpakstan, but the analysis shows that the negative externalities caused by the environmental crisis have affected the development of the sector. In particular, as a result of salinization of lands, increasing water scarcity, the fund of pastures and hayfields in the region, the efficiency of their use, changes in the composition of livestock, the existing potential is not fully used.

Literature review. Development of livestock and livestock production, as well as their growth rate and forecasting problem have been a key research topic beyond the researchers. Several authors conducted a research on this topic such as Petrovic, M.P. & Petrovic, M.M. & Petrovic, Caro & Muslic, Ruzic & Ilić, Zoran & Petrović, M & Pavlovski, Zlatica, who studied principles of livestock development [6], Herrero, Mario & Grace, Delia & Njuki, Jemimah & Johnson, Nancy & Enahoro, Dolapo & Silvestri, Silvia & Rufino, Mariana studied the roles of livestock in developing countries. [7], Petrovic P.M learned sustainable sheep breeding [8], Ivanovic L., Jelocnik M., Bekic B. conducted research on possibilities for increment of livestock breeding [9], Mehrabi, Zia & Gill, Margaret & Van Wijk, Mark & Herrero, Mario & Ramankutty, Navin looked through livestock policy for sustainable development [10], D`A, Hirwa & Ebong, Cyprian & Jules, Mutabazi & Mutimura, Mupenzi & Felix, Nyirishema & Ampon, Wallace studied livestock Farming and Management [11], Megersa, B., Markemann, A., Angassa, A. & Valle Zárate, A. conducted research on the role of livestock diversification in ensuring household food security [12], Sloat, L. L. et al. studied increasing importance of precipitation variability on global livestock grazing lands [13], Hiernaux, P. & Ayantunde, A. Te Fakara leraned a Semi-arid Agro-ecosystem Under Stress [14], Ashley, S., Holden, S. & Bazeley, P. studies livestock in Development [15], Alam, J learned impact of smallholder livestock development project [16], Fraval, S. conducted research on food Security in Rural Sub-Saharan Africa. A Household Level Assessment of Crop-Livestock Systems [17], Murphy, S. P. learned animal source foods to improve micronutrient nutrition and human function in developing countries [18].

Research methodology. In the research used empirical and theoretical methods, data collection and processing, logical analysis, statistical analysis, correlation-regression analysis.

Analysis and results. According to the results of the study [1], an increase in the share of cattle in the livestock sector in the region, but a decrease in the number of sheep and goats, yearlings, camels, which are promising areas. One of the main reasons for this is the reduction of pastures and hayfields, which is an important factor in the development of the above areas of animal husbandry, on the other hand, the efficiency of their use remains low.

With this in mind, in the future, the government will focus on the development of livestock in the region, the establishment of specialized areas for livestock, with a focus on further increasing the capacity of existing pastures and hayfields, reducing the impact of negative externalities. As a result of the implementation of a number of such measures, it is observed that the negative trends caused by external effects are changing for the better.

In order to assess the effectiveness of these measures [2] and determine the direction of livestock development in the future, based on the data of 1991-2020, the volume of production of major livestock products in the Republic of Karakalpakstan, important and regional areas of animal husbandry We have developed forecast indicators of the number of head on. The ARIMA model, which is widely used in time series and has a relatively high level of reliability, was used to determine the forecast values.

When working with time series, it is necessary to check the data for stationary, because their non-stationary causes the model results to be inaccurate and inadequate. When the indicators are non-stationary, they are brought to a stationary form by taking their primary or secondary differences. The total value of livestock products created in the Republic of Karakalpakstan (Y), the volume of meat (Y1) and milk produced (Y2), cattle (X1), cows (X2), sheep and goats (X3), horses (X4) and we aimed to develop forecast indicators of the number of camels (X5). Therefore, we tested the above indicators for stationary based on Unit root results using EViews 7 (Table 1).

Table 1

Unit root test results for stationary data

Date name	ADF	P value		Date name	ADF	P value	
Y	-6.5	0.0001	I(1)	X_2	-5.1	0.0016	I(1)
Y_1	-6.1	0.0002	I(1)	X_3	-5.5	0.0006	I(1)
Y_2	-8.3	0.0000	I(2)	X_4	-4.1	0.0168	I(1)
X_1	-4.5	0.0068	I(1)	X5	-4.8	0.0035	I(1)

According to the root results of the unit, the first difference in the volume of total livestock products, the first difference in the amount of meat grown, the second difference in the volume of milk was found to be stationary. In addition, we checked the stationary data on the number of head in each direction of livestock. From the data in Table 1 above, it can be seen that the primary difference in the number of head of livestock in all directions was found to be stationary.

Based on the above data, we initially developed ARIMA models for livestock production and forecast values based on these models. Data from 1991-2020 and the Gretl program were used to create these models. To develop the forecast values of the total livestock production, the real values determined using the 2000s as the base year were used. As a result, let's have a model that looks like the following.

$$\Delta Y_t = 1.18 + 0.91 * \Delta Y_{t-1} - 0.77 * \varepsilon_{t-1} + \varepsilon_t$$
$$se = (0.71)(0.12) \qquad (0.15)$$
$$se = (1.66)(7.33) \qquad (-5.07) R^2 = 0.98$$

According to the results of this model, all coefficients are adequate, but the adequacy level of the coefficient determined on the free limit is appropriate in the 90 percent confidence interval. According to the results of the regression analysis on the volume of meat production, the following equation was obtained. That is, the primary difference in meat production volume has a primary autocorrelation.

$$\Delta Y_{1t} = 0.84 * \Delta Y_{1t-1} + \varepsilon_t$$
$$se = (0.091)$$
$$se = (9.19) R^2 = 0.99$$

We carry out a similar analysis in relation to the volume of milk production. Only the secondary difference in the data on milk production volume is stationary. As a result,we have the following ARIMA model.

$$\Delta^2 Y_t = -0.4 * \Delta^2 Y_{t-1} - 0.92 * \varepsilon_{t-1} + \varepsilon_t$$
$$se = (0.17)(0.12)$$
$$t = (-2.33)(-7.73) R^2 = 0.64$$

Taking into account the adequacy of all the coefficients identified in this model, on the basis of the above models we have developed forecast indicators of the cost and volume of livestock production in the Republic of Karakalpakstan until 2025 (Table 2).

Table 2

Forecast indicators of production of basic livestock products in the Republic of Karakalpakstan

Years	***Livestock products by QR (million soums)***	**Meat (live weight), thousand tons**	**Milk, tons**
	Y	**Y_1**	**Y_2**
1991	16.5	50909	182784
2000	16.1	38980	326136
2010	30.9	58881	183553
2015	42.5	88402	322130
2016	46.0	95160	346975
2017	47.6	102299	364654
2018	48.3	104575	284675
2019	52.0	106851	386261
2020	53.3	110701	403833
Forecast indicators			
2021	55.1	113930	413847
2022	56.8	116639	426908
2023	58.5	118910	438740
2024	60.1	120815	451068
2025	61.7	122414	463196

According to the forecast, by 2025, the real value of total livestock production in the Republic of Karakalpakstan in 2010 as a base year will be 61.7 billion soums. In

other words, the average annual growth rate will be 3%, with an increase of 1.16 times compared to 2020. Taking into account that a significant part of livestock products created in the region are meat and dairy products, and these products are considered as the main products in animal husbandry, we have also developed forecast indicators of their physical volume until 2025.

According to our calculations, the average growth rate in the next 5 years will be 2%, while meat production in the region will increase by 1.11 times. It can be seen that these figures for milk production are 1.15 and 2.7 percent, respectively. It is obvious that in recent years, the volume of milk production in the region is growing faster than meat. According to our analysis, the share and role of cattle, sheep and goats in the production of these products remains significant. The share of low-yielding horses and camels in crop production also remains low.

It was noted that the development of livestock in the region [3], the measures taken to specialize livestock in areas with pastures and hayfields, also have an impact on changes in the composition of livestock. With this in mind, we will develop forecast indicators of changes in the number of livestock in the Republic of Karakalpakstan in the next 5 years.

To perform the regression analysis, the Gretl program and the 1991-2020 data were used directly without processing the data because the indicators were presented in physical form. As a result, the models developed and used to predict the number of head by livestock directions and the test results to verify their adequacy have the following appearance.

$$\Delta X_{1t} = 0.95 * \Delta X_{1t-1} - 0.67 * \varepsilon_{t-1} + \varepsilon_t$$
$$se = (0.07)(0.19)$$
$$t = (14.35)(-3.55) R^2 = 0.99$$

1. $$\Delta X_{2t} = 0.96 * \Delta X_{2t-1} - 0.69 * \varepsilon_{t-1} + \varepsilon_t$$
$$se = (0.07)(0.15)$$
$$t = (13.96)(-4.44) R^2 = 0.93$$
2. $$\Delta X_{3t} = 0.93 * \Delta X_{3t-1} - 0.77 * \varepsilon_{t-1} + \varepsilon_t$$
$$se = (0.12)(0.18)$$
$$t = (7.85)(-4.18) R^2 = 0.93$$
3. $$\Delta X_{4t} = 0.86 * \Delta X_{4t-1} - 0.58 * \varepsilon_{t-1} + \varepsilon_t$$
$$se = (0.24)(0.30)$$
$$t = (3.59)(-1.94) R^2 = 0.93$$

It can be seen that all of the results of the Student Criteria cited for checking the adequacy of the coefficients of the four equations are outside the critical range and that their probabilities are less than 0.05. The full form of the results obtained [4] is also given, from which it can be seen that the model is adequate and reliable in other respects as well. Given that the second coefficient determined in the model used to predict the number of years only was -1.94 by the Student Criterion and its probability index was 0.053, i.e. the probability was almost 95%, we found it appropriate to use it.

We would like to cite the forecast figures for the number of head of livestock developed on the basis of these models (Table 3).

Table 3

Forecast indicators of production of basic livestock products in the Republic of Karakalpakstan

Years	Cattle	Of which: cows	Sheep	Horses
	X_1	X_2	X_3	X_4
1991	373198	145305	529991	13805
2000	379814	161819	559724	16579
2010	715792	163779	460905	15137
2015	871735	219079	653912	17218
2016	955011	224015	674659	17778
2017	1009333	237796	730276	18302
2018	1057947	254117	764276	18529
2019	1110586	320904	1115059	24476
2020	1148622	332596	1154006	25912
Forecast indicators				
2021	1188050	353048	1218310	27366
2022	1225740	372611	1278370	28615.2
2023	1261770	391324	1334490	29688.4
2024	1296220	409223	1386910	30610.4
2025	1329160	426345	1435890	31402.5

According to the analysis, the average annual growth rate of cattle in the coming years will be 3.7%, and by 2025 the total number of cattle in the region will reach 1329,160, an increase of 1.19 times compared to 2020.

The forecast of the number of cows was carried out separately, because the above analysis shows that although the number of cows has an indirect and indirect effect on meat and milk production, in both cases there is a high correlation between the number of head and the volume of production. In addition, according to the forecast values, the highest growth rate in the next few years will be the number of cows, ie the average annual growth rate will be 1.38 times over the next five years, while the average annual growth rate will be 5.8%.

There will also be a high increase in the number of sheep and goats, ie the average annual growth rate of their number will be 5.2%, while the figure for the number of horses will be 5.1%. As a result, the number of heads in both directions will increase 1.29 and 1.28 times, respectively, over the next five years. According to the comparative analysis, these changes are the result of measures taken in the first years to eliminate the structural changes caused by soil salinization, depletion of pastures due to aggravation of drought, mitigation of external effects, livestock development in the region. found to be directly related to the achievement of positive results.

In order to illustrate this process on the basis of exact figures and to assess the effectiveness of the measures taken, we focused on a comparative statistical analysis of the results obtained for the study period and forecast indicators (Table 4).

According to the results obtained, as a result of the impact of external factors [5], an increase in the share of cattle, sheep and goats, a decrease in the share of horses was observed. According to the comparative analysis, over the next 5 years, the average annual growth rate of large horned cattle will decrease from 3.95% to 3.66%, i.e. sheep and goats, horses will increase their share as a result of increasing the average annual growth rate.

Table 4

The results of the assessment of the impact of changes in subsequent years on the basis of forecast indicators

	Changes from 202 to 19912020	Average annual growth rate for 1991-2020	Change from 2025 to 2020	Average annual growth rate for 2020-2025
Cattle X1	3.08	3.95	1.20	3.66
of which: cows X2	2.29	2.90	1.33	5.85
Sheep X_3	2.18	2.72	1.29	5.19
Horses X_4	1.88	2.20	1.28	5.11

Discussion. We would like to focus on the number of cows, which is a component of large cattle, because despite the decline in the total number of cattle, an increase in the growth rate of cows from 2.9% to 5.85% will increase the share of cows in the number of cattle.

If we directly compare the values of the average annual growth rate of the number of sheep and goats in the two periods, the average annual growth rate of this indicator will increase from 2.72% to 5.19% and the average annual growth rate will increase by 1.9 times. In terms of number of horses, these figures are 2.20, 5.11 and 2.32, respectively. It can be seen that the change in the average annual growth rate of the number of horses has a higher value than the others.

It was found that the effects of external influences and its consequences were reflected in changes in livestock composition. Changes in livestock composition are directly related to the average annual growth rate of head count. According to the results of the above comparative analysis, the average annual growth rate by livestock has changed, which in turn leads to a change in the composition of livestock. Continuing the analysis, we would like to focus on changes in livestock composition (Figure 1).

According to the results, a sharp change in the composition of livestock in the Republic of Karakalpakstan occurred in 2010. According to the findings of the study, the drought in the region in 2008 served to exacerbate the effects of external shocks caused by the drying up of the Aral Sea, resulting in a decrease in the number of livestock grazed on pastures and hayfields. This has led to a 52.8 per cent share of large horned cattle whose numbers are less dependent on pastures and hayfields. However, in the subsequent period, reducing the impact of these negative externalities, the work on the development of animal husbandry in the region has yielded results, provided a

positive change in the proportion of sheep and goats in the total livestock in accordance with the potential of the region.

In particular, by 2020, their share increased by 9.37 units compared to 2010, reaching 43.37%, and the forecast confirms that this change will continue in subsequent years. According to the forecast, in the next 5 years, the total share of cattle will decrease, the share of cows will increase, and the share of sheep and goats will also increase. Although an increase in the number of horses has been observed, their share remains unchanged as they are very small in quantity.

Conclusion. According to the analysis, the development of livestock in the Republic of Karakalpakstan, including increasing the efficiency of the use of pastures and hayfields is one of the promising areas. However, this requires addressing the issue of reducing the impact of negative externalities resulting from environmental crises. Based on the results of the analysis to find a solution to this problem, we can conclude that one of the most effective areas is the government's special attention to the development of various programs for livestock development, improving the economic and legal framework to support the sector.

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THE IMPACT OF FORMATION OF INNOVATIVE ECONOMY TO THE CYCLICAL DEVELOPMENT

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Annotasiya. Maqolada inqirozga qarshi dasturlar tahlili asosida sistemali risklar va iqtisodiy inqirozlarga qarshi immunitetni innovasion rivojlanish orqali shakllantirish yoritib berilgan. Shuningdek, innovasiyalarga sarf-harajatlarning oshirilishi iqtisodiy o‘sishga olib kelishi asoslangan. Maqola so‘ngida tadqiqot natijasida olingan xulosalar bayon etilgan.

Kalit so‘zlar: innovasion rivojlanish, iqtisodiy inqiroz, inqirozga qarshi dasturlar, ITTKI, iqtisodiy o‘sish, bilimlarga asoslangan iqtisodiyot, siklik rivojlanish.

Аннотация. В статье раскрывается формирование иммунитета к системным рискам и экономическим кризисам через инновационное развитие (НИОКР)

экономики путем анализа антикризисных программ. Также утверждалось, что увеличение расходов на инновации приведет к экономическому росту. В конце статьи представлены выводы исследования.

Ключевые слова: инновационное развитие, экономический кризис, антикризисные программы, НИОКР, экономический рост, экономика основанная на знаниях, циклическое развитие.

Annotatsiya. Maqolada inqirozga qarshi dasturlarni tahlil qilish orqali iqtisodiyotning innovatsion rivojlanishi (R va D) orqali tizimli xatar va iqtisodiy inqirozlarga qarshi immunitet shakllanishi ochib berilgan. Shuningdek, innovatsiyalarga sarflanadigan mablag'larning ko'payishi iqtisodiy o'sishga olib keladi, deb ta'kidlangan. Maqolaning oxirida tadqiqot natijalari keltirilgan.

Kalit so'zlar: innovatsion rivojlanish, iqtisodiy inqiroz, inqirozga qarshi dasturlar, R va D, iqtisodiy o'sish, bilimga asoslangan iqtisodiyot, davriy rivojlanish.

Аннотатция. В статье раскрывается формирование иммунитета к системным рискам и экономическим кризисам через инновационное развитие (НИОКР) экономики путем анализа антикризисных программ. Также утверждалось, что увеличение расходов на инновации приведет к экономическому росту. В конце статьи представлены выводы исследования.

Ключевые слова: инновационное развитие, экономический кризис, антикризисные программы, НИОКР, экономический рост, экономика, основанная на знаниях, циклическое развитие.

Abstract. The article reveals the formation of immunity against systemic risks and economic crises through the innovative development (R and D) of the economy by the analysis of anti-crises programs. It has also been argued that increasing of spending on innovation will lead to economic growth. At the end of the article, the conclusions of the research are presented.

Key words: innovative development, economic crisis, anti-crises programs, R and D, economic growth, knowledge based economy, cyclical development.

Introduction. At the beginning of the XXI century sharping fluctuations and declines in the world economy, as a result of globalization increasing the level of dependence of economic relations, decrease gross demand in world markets, continuous increase the level of foreign debts of countries, decrease the scope of economic sanctions against countries such as China, Russia and Iran by USA and EU the fact that the global financial and economic crisis, which began in 2008, has not completely ended and this requires further improvement of measures to combat crises in the world economy. According to the World Bank, at the end of 2019, the growth rate of international trade will be from 2,6 % to 1,5 %, while the growth rate of the GDP will be from 2,5% to 2,3% in the US, from 1,2 % to 1,1 % in EU countries and from 6,2 % to 6,1 % in China. The amount of mutual debts in the countries of the world is approaching 250 trillion US dollars and this is more than twice of the size of world GDP[1].

Literature review. By the beginning of the third millennium, the necessity of moving from industrial to an innovatively developed economy for developing economies of countries became a major issue on the agenda. This ushered in a new era in the innovative development based on the knowledge economy. This is explained by the following factors:

One of the most important phases of the rise, recession, depression and revival of the long cycles, consisting of 4 stages in the economy, the revival phase occurs as a result of the efforts of producers of goods and services and the implementation comprehensive measures to restore the economic balance in the direct intervention of the state. Of particular importance is the participation of innovations in this phase [2];

According to the American economist Thurow's research on human capital, economic indicators, such as economic growth, income distribution in the economy, level and quality of production, social sphere are directly related to human capital, in other words, "the concept of human capital is the basis of modern economic research" [3];

In 1988, the American economist Lucas in his research, studied the role of human capital in the economic development of the country and concluded that the country's economic and human capital indicators are in direct proportion to each other [4];

According to Grayson, it is human capital that emerges as a factor of competitiveness, economic growth, and efficiency, not factory, equipment or production stock[5];

The process of accumulation of knowledge of human capital has a direct impact on the economic development and growth rates of the country, which is determined by the Organization for Economic Cooperation and Development [6];

An innovative economy, based on in-depth knowledge, prevents any crises[7];

While the first category of countries supplies only raw materials and low value-added products to the global value chains in the world economy, other categories of countries supply high value-added products. The second category of countries prepares the final product and re-exports it. Participation in the global value chain in this way is backward, while the first category of countries that supply intermediate products or raw materials to the final product manufacturer participate in the forward way. Countries participating in the global value chain backward will increase their export potential and the country will be less sensitive to external influences, which means that the country will be competitive [8].

Research and results. For the years 2008-2010 within the framework of anti-crisis programs several trillion US dollars were spent. In particular, in US 2,3 trillion US dollars [9], which 5,8 times more than the amount spent by this country on R and D in 2010 year. In EU were spent 2,6 trillion US dollars [10], in Japan 1,06 trillion US dollars [11] – which 7,5 times more than the amount spent on R and D in 2010, in China 0,57 trillion US dollars [12] and 0,22 trillion US dollars spent in Russia [13]. Accordingly, this figure is 4 in China and 10 times more than spent on R and D in Russia. But despite the fact that so many funds have been spent, the negative consequences and losses of the crisis have not been completely eliminated to nowadays.

One of the internal factors that caused the outbreak of the global financial and economic crisis, which began in 2008 year in Russia, is the low level of application of innovations in the economy. Because the innovative economy positively affects the pace of economic growth of the country and is one of the main elements of anti-crisis measures. For 2007-2014 years, the Innovation Index has had a growth trend in developed countries. In particular, if the growth rates of 4,8 % in South Korea, 3,6 %

in China, 2,4 % in the European Union and 1,0 % in the US were recorded, then this indicator is negative and is equal to -1,6 % in Russia [14]. The highest figure in this regard belongs to China, and as a result of the level of state policy of innovation development in the country, this figure is noted.

This financial and economic crisis, which began in the US, later appeared in the world in the form of a series of banking crises, a financial crisis, a migration crisis, a crisis of external sovereign debt and a crisis of raw materials. One of the peculiarities of this world financial and economic crisis is that when grouping the causes of the origin of the crisis, we can see that they are in harmony with each other. In particular, the habituation of living on credit was manifested in the form of an instrumental reason (unreasonable loosening of the lending practice) and a human behavior reason (the implementation of the current consumption to the account of future income). As a result, several difficulties were encountered in determining the nature of the crisis.

According to the results of the research of crises in the XIX-XXI centuries, since the first classical crisis occurred, economic crises are observed to repeat approximately every 15-20 years interval [15].

In the last years, the range of the development of the economy cycle was reduced up to The Kitchen cycle due to the increasing integration in the world economy, the acceleration of the globalization process and technological innovation. As a result, there is a need to put into practice the options of combating the crisis, which will show positive results at short period.

Under these circumstances, the formation of an innovative economy serves to increase the level of the national economy's immunity to risks. In recent years, the holding of the standard level of funds spent on innovative development (R and D) in the world used as a point for economic growth (figure 1).

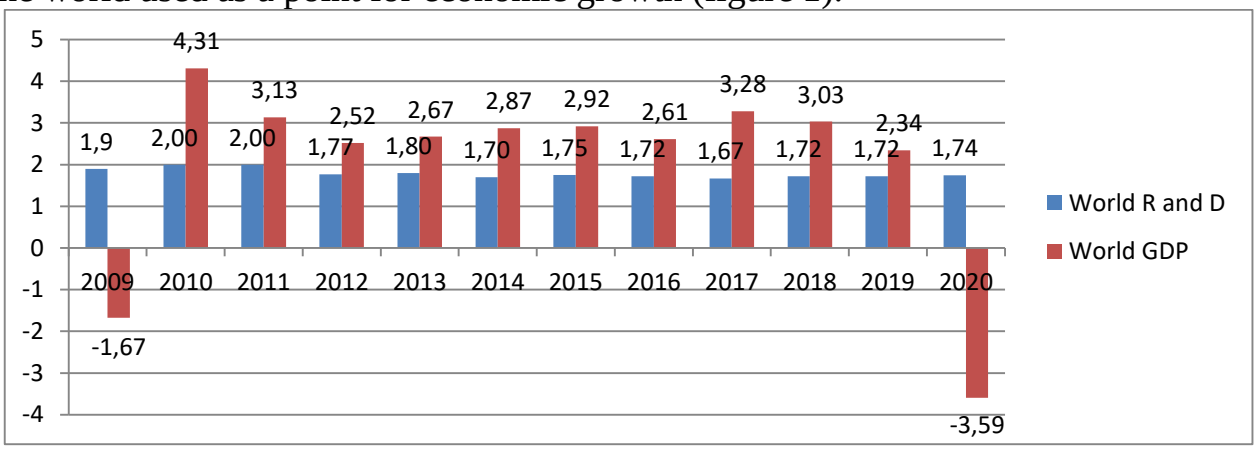

Figure 1. Interconnection between spending on R and D and GDP in the world [16], in percent

In 2010, the increase in the amount of expenses to R and D from 1,9 % to 2,0 % led to an increase in GDP from -1,67 to 4,31 %. By 2012, a reduction in the amount of expenses for R and D caused a decrease from 3,13 % to 2,52 % of the GDP. Over the following years, the reduction of spending on R and D was an impetus to the decrease in the volume of the GDP or vice versa. For the further growth of the world economy, it will require an increase in the amount of R and D. In 2020, due to coronavirus pandemic,

the additional annual growth rate of world GDP was -3,59 %. Further increase in spending on innovation is critical to achieving economic growth.

One of the main directions of measures in the EU countries in the framework of the fight against the crisis is the development of innovations. In the last years, the world's spending on R and D has been increasing. Even in the five countries mentioned above, the amount of funds spent in this sector has been growing steadily since 2010 to the present day. It is giving its effect in the fight against systemic risks and economic crises through innovative development of the economy. Because it is more expedient to fight against crises than to eliminate the negative consequences of the economic crisis and mitigate its losses.

In anti-crisis programs, measures such as the provision of tax benefits, support for the infrastructure and social sphere, the development of the Real sector, the stabilization of the banking system have taken place. It should be borne in mind that under the program against the financial and economic crisis, which occurred only in 2010 in world, 15-19 % of the GDP in developed countries was spent, 10 % in developing countries and 14,4 % in Russia.

As a result of the implementation of the functions of the programmes, economic growth in the countries was seen as follows (Table 1).

Table 1.

The growth rate of the countries' GDP [17], in percent

№	Countries	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
1.	**US**	2,56	1,55	2,25	1,84	2,53	3,08	1,71	2,33	3,00	2,16	-3,49
2.	**EU**	2,21	1,82	-0,75	-0,05	1,57	2,30	2,01	2,80	2,11	1,56	-6,20
3.	**Germany**	4,18	3,93	0,42	0,44	2,21	1,49	2,23	2,60	1,27	0,56	-4,90
4.	**Japan**	4,19	-0,12	1,50	2,00	0,37	1,22	0,52	2,17	0,32	0,27	
5.	**China**	10,64	9,55	7,86	7,77	7,43	7,04	6,85	6,95	6,75	5,95	2,30
6.	**Russia**	4,50	4,30	4,02	1,76	0,74	-1,97	0,19	1,83	2,81	2,03	-2,95

If we take into consider given that the experts of the World Bank lowered the growth rates of GDP in US by the end of 2019 year, none of countries in the table could achieve GDP’s growth rates in 2010 year results. The need to launch a new driver for the development of the world economy is emerging. And this, of course, is done with the more implementation of innovations.

In our opinion, the innovative development of the sphere of production and services takes place in the following chain movement such as the domino effect, which plays a very important role in the fight against crises:

Innovative development of the sector of production and services → introduction of the latest science and technical achievements to the sector → the inflow of the infrastructure investments → the improvement of the infrastructure → use of energy-saving technologies → decline the cost of products and services → increasing competitiveness of products and services → the opportunity to enter the world market with products with high science consumption → quickly adapt to the conjuncture of the world market and strong acquisition of its own syngment → strengthening the competitiveness of the country → ensuring sustainable economic growth [18].

The indicator of innovative development is represented by the share of expenses allocated for R and D in the country's economy (Table 2).

Table 2.

The trend of change in spending on R and D in countries [19]

№	Country	Funds allocated to R and D over the years compared to GDP, in % (billion US dollars)					Change, compared to 2010, in %
		2010	2012	2015	2018	2020	
	USA	2,8 (395,8)	2,85 (436,0)	2,77 (496,84)	2,84 (552,98)	2,88 (580,20)	146,6
	Germany	2,4 (68,2)	2,87 (90,6)	2,92 (112,16)	2,84 (116,56)	2,84 (121,65)	178,4
	Japan	3,3 (142,0)	3,48 (157,6)	3,41 (164,59)	3,50 (186,64)	3,50 (181,10)	127,5
	China	1,4 (141,4)	1,60 (198,9)	1,92 (372,81)	1,97 (474,81)	1,98 (574,40)	406,2
	Russia	1,0 (22,1)	1,08 (26,9)	1,5 (55,77)	1,52 (58,62)	1,50 (58,92)	266,6

From the table data we can see that in the years after the crisis, there was a tendency to increase the expenditure on R and D in all countries. The largest figure belongs to China, which recorded in 2020 a result of 406, 2 % more than 2010 year. And in Russia was indicated 266, 6 % growth than 2010.

In innovative developed countries, the national innovation system is characterized by a high level of defense of the economy to external influences, and the negative consequences of the global financial and economic crisis, which began in 2008, were degree without sensation [20].

Conclusion. In summary, the innovative development of the economy serves as one of the main platforms in the fight against economic crises, by growth incomes, increase the role of the human factor in society, reduction the level of environmental pollution, the restoration of "green economy", the rapid adoption of the latest achievements of science and technology, increasing the competitiveness of the economy, achieving stable economic growth rates.

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MANDELSTAM-BRILLUEN SCATTERING IN A STRETCHING SOLUTION

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Annotatsiya: Suyuqliklarda gipertovush tezligi va yutilishini o'rganishga mo'ljallangan ikki o'tishli Fabri-Pero interferometri asosida ishlovchi tajriba qurilmasining ishlash prinsipi batafsil yoritilgan, aniline-siklogeksan eritmasida kritik nuqta atrofida Mandelshtamm-Brillyuen komponentalarining siljishi va kengligi o'rganilgan, bir jinsli faza tomonidan t_k ga yaqinlashganda Mandelshtamm-Brillyuen komponentalarining siljishining sekin o'sishi, bir fazali tomonidan t_k ga yaqinlashganda esa Mandelshtamm-Brillyuen komponentalari kengligining sekin o'sishi kuzatiladi,olingan natijalar asosida kritik nuqta atrofida gipertovush chastotasida sezish mumkin bo'lgan relaksatsion jarayonlar mavjudligi taxmin qilingan.

Kalit so'zlar: Gipertovush, tovush tezlig va yutilishi, binary aralashmalar, dispersiya, kritik nuqta, yorug'likning sochilishi, Fabri-Pero interferometri, Mandelshtamm-Brillyuen komponentalari, qatlamlanuvchi eritmalar,relaksatsion jarayonlar, konsentrasiya fluktuasiyasi.

Аннотация: Подробно описано принцип работы экспериментальной установки по изучению скорости и поглощения гиперзвука в жидкостях на базе двухпроходного интерферометра Фабри-Перо, измерено смещения и ширины компонент Мандельштама-Бриллюэна растворе анилин-циклогексан в окрестности критической точки, при приближении к t_k со стороны однородной фазы обнаружено медленное увеличение смещения компонент Мандельштама-Бриллюэна, а при приближении к Δt со стороны однофазного состояния наблюдается медленный рост значений ширины компонент Мандельштама-Бриллюэна, по полученнме результатам предположено существование релаксационных процессов ошутимых на гиперзвуковых частотах в окрестности критической точки.

Ключевые слова: Гиперзвук, скорость и поглощение звука, бинарные смеси, dispersiya, критическая точка, рассеяние света, интерферометр Фабри-Перо, компоненты Мандельтамма-Бриллюэна, расслаивающиеся растворы, релаксационные процессы, флуктуация концентрации.

Abstact. The principle of operation of an experimental setup for studying the velocity and absorption of hypersound in liquids based on a two-pass Fabry-Perot interferometer is described in detail, the displacements and widths of the Mandelstam-Brillouin components in aniline-cyclohexane solution in the vicinity of the critical point are measured, and a slow increase is observed when approaching tk from the side of the homogeneous phase the displacement of the Mandelstam-Brillouin components, and when approaching Δt from the side of the single-phase state, a slow increase in the widths of the Mandelstam-Brillouin components is observed, according to the results obtained, it was assumed that relaxation processes exist at hypersonic frequencies in the vicinity of the critical point.

Keywords: Hypersound, speed and absorption of sound, binary mixtures, dispersiya, critical point, light scattering, Fabry-Perot interferometer, Mandeltamm-Brillouin components, stratified solutions, relaxation processes, concentration fluctuation.

Introduction. Ultrasonic measurements of absorption and dispersion of the speed of sound near the critical point of separation of liquid binary mixtures are a fruitful method for studying the kinetics of second-order phase transitions. The available experimental and theoretical materials mainly contain the results of anomalous absorption of ultrasonic waves. At the same time, there are no data in the literature on the absorption of the hypersonic range in general.Studies of Mandelstam-Brillouin scattering [MB], it seemed, should have provided a lot of information about physical processes near the critical point, just as the corresponding studies in pure liquids [1] provided valuable data on relaxation processes affecting the propagation of sound.

However, such studies in solutions are still little used when discussing various theoretical models of the Critical State because of certain experimental difficulties and large errors arising in the study of the scattering spectrum near the critical point. In most works, a low-contrast single-pass Fabry-Perot interferometer was used. Therefore, the light of a very intense central component arising from scattering by

concentration fluctuations partially falls into the frequency range where the Mandelstam-Brillouin components are observed. This leads to a noticeable but poorly controlled decrease in the measured values of their displacements, and, consequently, the corresponding, experimentally determined, values of the speed of sound.

The inaccuracy of the results obtained as a result of this using a low-contrast Fabry-Perot interferometer can explain the appearance of a report on the observation of a negative dispersion of the speed of sound near the critical point of separation of solutions [2]. Later measurements with a two-pass interferometer did not confirm this result [3]. When measuring the displacement of the Mandelstam-Brillouin components using a two-pass high-contrast Fabry-Perot interferometer, the central component due to light scattering by concentration fluctuations does not affect the position of the Mandelstam-Brillouin components. However, in work [3] performed with such an interferometer, only the speed of hypersound was measured and the width of the Mandelstam-Brillouin components and, consequently, the absorption coefficient of hypersound were not measured, which significantly reduces information on the nature of the processes affecting its propagation. This obviously also limits the possibility of using the experimental results to discuss physical processes near the critical point.

Experiment.

The present work assumes an attempt to fill, as far as possible, this gap. For this, similarly to [3,4,11-15], we used a high-contrast two-pass Fabry-Perot interferometer developed by us. The schematic diagram of the experimental setup is shown in Fig. 1.

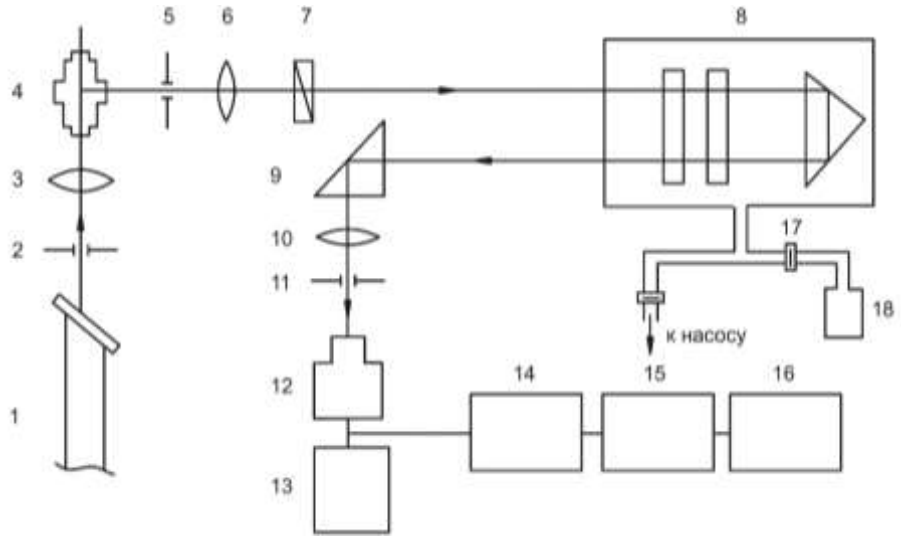

Fig. 1.

Schematic diagram of the experimental setup for recording the fine structure spectra of the Rayleigh line:

1- He-Ne laser; 2 - diaphragm; 3 - lens (120 mm); 4 - a vessel with a test liquid; 5 - diaphragm; 6 - collimator lens (210 mm); 7 - polarizer (Frank-Ritter prism); 8 - pressure chamber with a two-pass Fabry-Perot interferometer; 9 - rotary prism; 10 - camera lens (270 mm); 11 - aperture (0.25 mm); 12 - Photomultiplier tube (PMT)-79; 13 - PMT power supply unit; 14 - emitter follower; 15 - linear intensity meter; 16 - KSP-4 recorder; 17 - supersonic needle leakage valve; 18 - nitrogen cylinder.

It turned out that with our accuracy of setting the angles (± 0.20), the error in determining the displacement of the Mandelstam-Brillouin components for a scattering angle of 90º did not exceed 1%. To reduce the influence of random errors, the spectra were recorded at least four times (four orders of the spectrogram), and the results of processing the spectra were averaged. An He-Ne laser (wavelength 632.8 nm, radiation power about 15 mW) was used as a source of exciting light (1). The laser beam was focused by a long-focus lens (3) into a cell (4). The scattering angle was set using a pentaprism (accuracy ± 0.2 °). In the path of the scattered light, there was a Frank-Ritter prism (7), which made it possible to select the scattered light of the required polarization. The polarizer alignment accuracy (± 0.5 °) was quite satisfactory for the experiment. The scattering volume was at the focus of the objective (6), which formed a parallel beam of rays passing through the Frank-Ritter prism and then incident on the Fabry-Perot interferometer (8).

To ensure the linearity of the gas leak during scanning, we used a needle supersonic leak (17). To increase the linearity of scanning, a ballast volume was used. The gas (nitrogen) pressure at the inlet of the leak was 6-8 atm. Such a gas supply system allowed us to achieve that the nonlinearity of scanning at three orders of the interferogram was no more than 0.5%. After a two-pass interferometer, the scattered light, passing through a rotating prism (9), was collected in the focal plane of a camera lens (10) with a focal length of 270 mm. Aperture (11) is installed in the focal plane of the camera lens. The radius of the diaphragm was selected empirically, proceeding from the condition of the minimum broadening of the instrumental function. For example, in the case when an interferometer with a dispersion region of 0.417 cm was used, the diaphragm had a diameter of 0.25 mm.

The half-width of the instrumental function becomes minimum when the exit diaphragm is placed in the center of the interference pattern. The diaphragm was adjusted using two micrometric screws moving it in mutually perpendicular directions in the focal plane of the objective (10). A cooled photomultiplier PMT- 79 operating in the photon counting mode was used as a photodetector in our setup.

The PMT cooling circuit is assembled on the basis of a semiconductor microcooler operating on the principle of the Peltier effect. Cooling of the PMT to -25 ° C was achieved within 1 hour. Upon cooling to this temperature, the number of dark pulses decreased from 100-150 pulses / s to 10-15 pulses / s, with the same photocathode sensitivity.

Pulses from the photomultiplier anode were fed to the input of the emitter follower (14). The emitter follower has a sufficiently high input impedance and low input capacitance, which, along with a low output impedance, is necessary for pulse transmission. Then the signal entered the input of the discriminator of the PI-4-1 linear analog intensimeter (15), which passed the pulses with the amplitude specified by the discriminator. At the output of the intensimeter, a voltage constant in sign appeared, the value of which was proportional to the number of pulses per second, which was then fed to the KSP-4 potentiometer (16), the recorder of which recorded the signal on a chart tape. The spectrum was scanned by changing the pressure in the body of the Fabry-Perot interferometer using a leak system 17, 18. The linearity of the leak [1%]

by three orders of interference was ensured by using a needle leak 17. The Fabry-Perot interferometer used had a contrast ratio of $6*10^4$ and a sharpness of 40.

The cuvette with the solution under study was placed in a specially made thermostat, the temperature in which was maintained with an accuracy of 0.05 ° C.

The discussion of the results.

The high value of contrast and sharpness in the interferometer used made it possible to measure the displacement Δν and the width δν of the Mandelstam-Brillouin components with high accuracy in a stratified aniline-cyclohexane solution near the critical point of separation and quite close to the critical point of separation in temperature.

The calculation of the hypersound speed was carried out according to the well-known expression

$$\vartheta = \frac{\Delta\nu_0 C}{2\nu n \sin\theta/2} (1)$$

where $\Delta\nu_0$, is determined from the displacement of the Matzdelaitama-Brillouin components Δν taking into account their finite width from the expression

$$[5]\,\Delta\nu = \Delta\nu\left(1-\frac{\delta\nu^2}{2\Delta\nu}\right)^{-\frac{1}{2}} (2)$$

In (1) and (2) n is the refractive index, C is the speed of light, ν is the frequency of the exciting light, Δν is the displacement of the Mandelstam-Brillouin components obtained from the experiment.

The data on the width of the Mandelstam-Brillouin components made it possible to determine the hypersound absorption coefficient α from the relation

$$\alpha = \frac{\delta\nu_{ncm}\pi C}{V} 3$$

Where $\delta\nu_{ncm}$ is the true width of the Mandelstam-Brillouin components

The measurement accuracy of Δν and δν is ± 0.5% and ± 5%, respectively.

The results of measuring the displacement and width of the Mandelstam-Brillouin components in the critical solution of aniline-cyclohexane are shown in Fig. 2. The measurements were carried out over a wide temperature range. In the homogeneous phase, the spectrum of light scattered from the volume was recorded in the region coinciding with the delamination region as the temperature dropped below t_k.

In fig. 2 shows the results both for a homogeneous phase above the critical temperature Δt> 0 (Δ, o is, respectively, the displacement and width of the Mandelstam-Brillouin components), and for temperatures below Δt <0 in both phases (●, ▼ - corresponds to a phase saturated aniline; ◙, ▲ - phase saturated with cyclohexane) at a distance of 10 mm from the delamination boundary.

Using expressions (1) and (3), the values of the rate ϑ and the absorption coefficient α were determined for an aniline-cyclohexane solution with a concentration of 0.44 ppm. aniline having a critical delamination temperature t_k=2.2 ± 0.05 ° C.

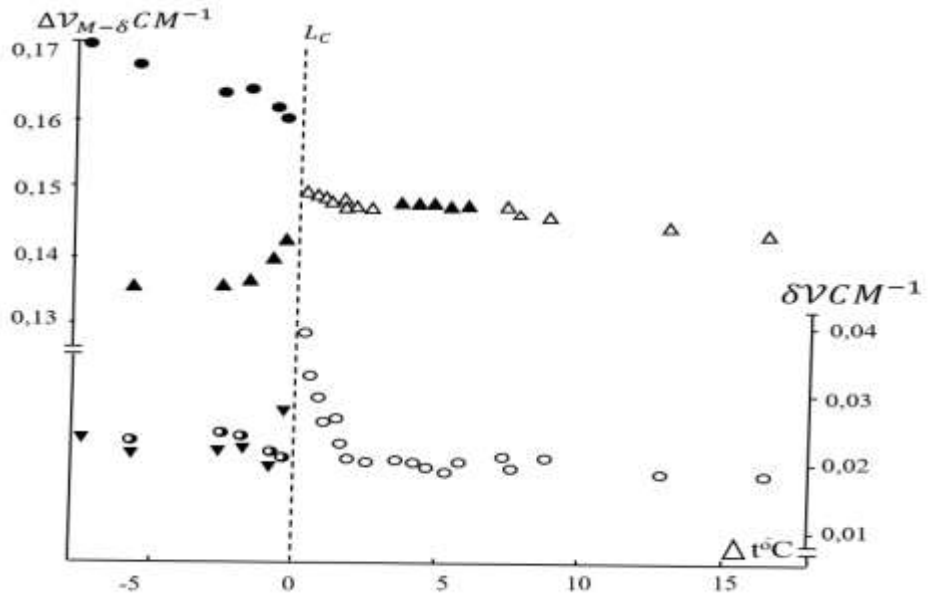

Fig 2.

In fig. 3 and 4 show typical spectra of scattered light near the critical temperature at and, respectively, obtained on a two-pass Fabry-Perot interferometer.

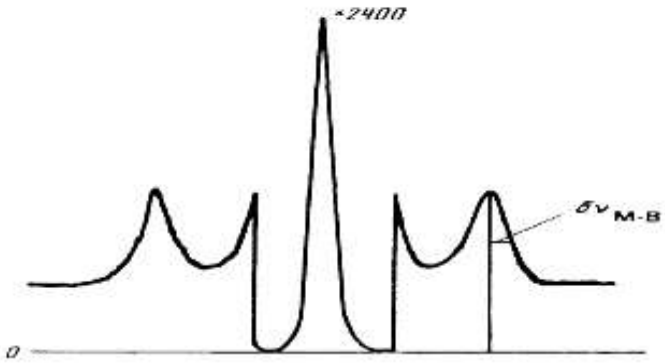

Fig 3.

It can be seen from Fig. 2 that, when approaching t_k from the side of the heterophase state, the difference in the values of the displacement Δν of the Mandelstam-Brillouin components for different phases decreases and tends to zero.

When approaching t_k from the side of the homogeneous phase to a slow increase in the displacement of the Mandelstam-Brillouin components is observed. From Δt ~ 7 ° C to Δt ~ 2 ° C, within the experimental error, the shift of the Mandelstam-Brillouin components remains constant. At Δt ~ 2 ° C, when approaching t_k, an increase in the mixing of the Mandelstam-Brillouin components is observed.

This figure also shows the temperature dependence of the width of the Mandelstam-Brillouin components. It can be seen from this dependence that for the width of the Mandelstam-Brillouin components, when approaching tk from the side of the heterophase state (t <t_k) to Δt = -0.4 ° C, no features are observed within the experimental errors.[11]

t ^{0}C	Δν sm^{-1}	δν sm ^{1}	ϑ m/s	α 10^3 sm $^{-1}$
32,5	0,1497	0,0388	1361	27,04
32,8	0,1490	0,0329	1345	23,04
33,0	0,1487	0,0296	1342	20,78
33,3	0,1476	0,0263	1332	18,59

33,4	0,1482	0,0265	1338	18,65
33,8	0,1477	0,0232	1334	16,33
34,1	0,1476	0,0204	1333	14,44
34,8	0,1470	0,0197	1328	13,94
35,8	0,1474	0,0201	1332	14,09
36,3	0,1480	0,0200	1337	14,10
36,8	0,1471	0,0192	1329	13,63
37,4	0,1473	0,0156	1332	13,13
38,0	0,1475	0,0203	1334	14,36
39,5	0,1469	0,0208	1329	14,77
41,1	0,1448	0,0197	1310	14,19
45,1	0,1445	0,0188	1309	13,54
48,6	0,1419	0,0188	1287	13,76

It is also seen that when approaching Δt from the side of the single-phase state ($t>t_k$) to Δt ~ 2 ° C, a slow increase in the widths of the Mandelstam-Brillouin components is observed, and at Δt <2 ° C, the width of the Mandelstam-Brillouin components increases very bistro. The acoustic properties of solutions with a critical separation point have been studied theoretically and experimentally for a long time and intensively. There are many theoretical works done to describe the experimental results obtained by measuring the velocity and absorption of ultrasound [6, 7, 8,11-15] taking into account the interaction of sound waves with slowly absorbing concentration fluctuations. As is known, these theories describe quite satisfactorily the propagation of ultrasound near tk. at frequencies not exceeding several tens of megahertz At high frequencies, such agreement of these theories with the experimental results could not be obtained [6, 7, 8 and 9,12].

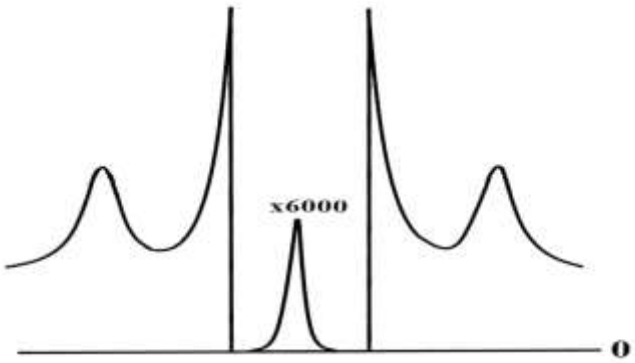

Fig 4.

Conclusion. Perhaps it should be assumed that these theories do not take into account the physical processes that significantly affect the nature of the propagation of high-frequency sound [109 Hz and more]. Indeed, the results of the calculated absorption values from the Mandelstam-Brillouin scattered light spectra show an anomalous strong absorption of hypersound at a temperature Δt_k <2 ° C and its growth as the critical separation point is approached. The preliminary estimate of the dispersion of the speed of sound in the aniline-cyclohexane system near the critical temperature is 1.5%, which is beyond the experimental error. The results obtained allowed us to assume significant relaxation processes at hypersonic frequencies in the vicinity of the critical point, which differ from the mechanism noted in [6, 7 ,8,11].

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METHOD OF OPERATIONAL REGULATION BY SHUNTING LOCOMOTIVES AT RAILWAY STATIONS

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Annotatsiya: Temir yo‘l stansiyalarida manyovr lokomotivlaridan foydalanish sharoitida yuk ob’ektlari o‘rtasida lokomotivlarni jo‘natish bo‘yicha tezkor qaror qabul qilish zarur. Lokomotivlarni bir yuk ob’yektidan boshqasiga o‘tkazishni tartibga solishda ko‘plab variantlar paydo bo‘ladi, bunda ulardan eng ratsionalini tanlash kerak. Mazkur maqolada manyovr lokomotivlarining rezerv bosib o‘tgan yo‘lini kamaytirish va samarali qaror qabul qilish jarayonini avtomatlashtirish maqsadida temir yo‘l stansiyalarida manyovr lokomotivlarini tezkor taqsimlash usuli ishlab chiqilgan va bu

usulga asos qilib simpleks usuli yechim sifatida tanlab olingan. Ushbu usul temir yo‘l stansiyasi tezkor xodimlariga yuk ob’ektlariga xizmat ko‘rsatuvchi manyovr lokomotivlarining ishini tezkor tartibga solish texnologiyasini ishlab chiqish imkonini beradi.

Kalit so‘zlar: tezkor taqsimlash, manyovr lokomotivi, Simpleks usuli, transport masalasi, qaror qabul qilish.

Аннотация: В условиях эксплуатации маневровых локомотивов на железнодорожных станциях необходимо принятие оперативного решения по пересылке локомотивов между грузовыми объектами. При регулировании пересылки локомотивов с одного грузового объекта на другой возникает множество вариантов, из которых необходимо выбирать наиболее рациональный. В данной статье разработан метод оперативного регулирования маневровыми локомотивами на железнодорожных станциях на основе Симплексного метода решения с целью минимизации резервного пробега маневровых локомотивов и автоматизации принятия эффективного решения. Данный метод позволяет оперативному персоналу железнодорожной станции разрабатывать технологию упорядоченного регулирования работы маневровых локомотивов, обслуживающих грузовые объекты.

Ключевые слова: оперативное регулирование, маневровый локомотив, Симплексный метод, транспортная задача, принятие решения.

Annotation: In the conditions of operation of shunting locomotives at railway stations, it is necessary to make an operational decision on the transfer of locomotives between cargo objects. When regulating the transfer of locomotives from one cargo object to another, many options arise, from which it is necessary to choose the most rational one. In this article, a method has been developed for the operational regulation of shunting locomotives at railway stations based on the Simplex solution method in order to minimize the reserve mileage of shunting locomotives and automate an effective decision. This method allows the operating personnel of the railway station to develop a technology for the orderly regulation of the operation of shunting locomotives serving cargo objects.

Key words: operational regulation, shunting locomotive, Simplex method, transport problem, decision making.

Introduction. In modern conditions, new requirements arise to reduce operating costs. Reducing operating costs in recent years has been a strategic challenge. One of the significant items of expenditure is the cost of transport for fuel and other material resources.

The problem of saving energy and fuel resources in railways attracts special attention. One of the tools that contribute to improving the quality and efficiency of planning and control of technological processes at stations, as well as the best use of shunting means and devices, is the operational regulation of shunting locomotives, especially when there are a large number of them at stations.

When shunting, along with saving time, it is necessary to reduce fuel costs. This cost item ranks second after wages, so the development of measures and recommendations for fuel saving is always effective.

In recent years, large-scale measures have been carried out on the CIS railways aimed at the transition to the formation of trains on fixed lines of the schedule [1]. In this transitional stage, the operating costs associated with the processing of wagons at stations, the organization of shunting operations, etc.

Thus, the need to reduce the cost of diesel fuel requires an immediate start of work on the development and implementation of technically sound norms of time and fuel consumption for shunting work and optimization of the regulation of the reserve run of shunting locomotives.

Today, scientists and specialists of railway transport are carrying out a lot of work to improve methods for performing various types of shunting work and to develop such a technology of shunting, which would take into account the potential capabilities of shunting means and devices, as well as the achievements of modern theory and practice of science. However, all these works are mainly aimed at the efficient operation of one shunting locomotive, replacing with shunting locomotives, reducing the time for performing shunting operations due to the development of stations, improving their track development schemes and equipment with modern means of automation and telemechanic

[2-4].

Based on the analysis of the experience of railways and the works of scientists, it can be concluded that the problem of resource conservation on railways, both in the near and far abroad, is given a lot of attention. However, research on improving the methods of operational regulation of shunting locomotives with a large number of them at railway stations on the basis of transport tasks has been insufficiently performed.

Analysis and results. Traditionally, the work of shunting locomotives is delimited by some territorial areas. There are two reasons for this:

- there is no need for operational distribution of work between them;
- the possibility of decoupling hostile routes incorporated in the projects of the signaling system is used.

With such a distinction between the work of locomotives, the work of the station attendant or shunting dispatcher is simplified. But the possibility of obtaining the effect of centralized control is lost:

- there are situations when some drivers are overloaded, while others are idle and cannot help them;
- the decoupling of hostile routes is achieved by delaying some movements at the expense of others.

When shunting locomotives operate without binding them across territorial areas (especially in conditions of industrial railway transport), the problem arises of developing a method for minimizing the reserve runs of shunting locomotives at railway stations.

The article deals with the operational regulation of shunting locomotives between cargo objects when there are large numbers of them. For various combinations of cargo objects with surplus and deficiencies of locomotives, as well as various combinations of surplus and deficiencies of shunting locomotives, it becomes necessary to periodically optimally “attach” a cargo object with a lack of locomotives to a cargo object with an excess of shunting locomotives. As a criterion for the optimality of

"attachment", it is advisable to take the minimum of total locomotive-kilometers of reserve mileage for the planned period. To optimize the reserve runs of locomotives within the circulation section, an algorithm for solving the "transport problem" was used, for which a program for solving this problem on a computer can be developed.

The solution of the transport problem, as you know, is carried out by several methods, which differ from each other in the way of filling in the transport matrix. At the same time, the transport task is divided into two types:

- open, in which the total number of free shunting locomotives differs from the total number of locomotive needs at cargo objects;
- closed, if the total number of free shunting locomotives is equal to the total number of trains that need to be supplied with shunting locomotives.

For the problem being solved, the appearance of free locomotives and cargo objects that need shunting locomotives is a random process, therefore, the total number of cargo objects that need to be provided with shunting locomotives and the number of locomotives that can be used for operation will be different. In this regard, the transport problem of optimizing the reserve runs of shunting locomotives within the circulation section will be of an open type. However, the solution to an open transport problem does not exist, so it must be reduced to a closed type. To do this, we introduce a fictitious cargo object (the shunting locomotive remains at the end of work, waiting for the command to operate them), which accepts all surplus locomotives if the number of shunting locomotives that can provide cargo objects exceeds the need for cargo objects for locomotives. If there is a shortage of locomotives, i.e. cargo objects that need more shunting locomotives than cargo objects in excess, then we introduce a fictitious cargo object that could send shunting locomotives (the cargo object is serviced by the shunting locomotive as they are released).

Initial data for solving the transport problem:

- the number of cargo objects that need to be provided with shunting locomotives;
- the number of shunting locomotives that can be used to provide these cargo objects;
- the distribution of the considered shunting locomotives by cargo objects;
- distance between stations.

Let's formulate the transport problem. It is required to draw up such a regulation plan for shunting locomotives, in which the total cost of locomotive-kilometers of reserve run would be minimal.

This plan is presented in the form of a table (matrix), the rows of which correspond to the cargo objects of surplus (release) of shunting locomotives, the columns - to the cargo objects in need of shunting locomotives (Table 1).

On the left of the table there are numbers of cargo objects, where shunting locomotives are waiting for work *1, 2,…, i,…, m;* at the top – numbers of cargo objects that need shunting locomotives *1, 2,…, j,…, n;* on the right – the excess number of shunting locomotives at each cargo object a_1, a_2,..., a_m, below – the number of missing locomotives for each cargo object b_1, b_2,..., b_n.

Each element of the matrix at the intersection of a row and a column means a possible dispatch to a cargo object with a shortage of shunting locomotives. So in cell 12 at the intersection of the first row and the second column, it means a possible dispatch from

cargo object 1 (excess of locomotives) to cargo object 2 (lack of locomotives). In general, the number of shunting locomotives sent from cargo object i to cargo object j is denoted as x_{ij}. In the upper left corner of each cell, the distance between cargo objects c_{ij}.

Table 1.

Matrix of the transport problem for the development of a method for minimizing reserve runs of shunting locomotives at railway stations

	1	*2*	…	*j*	….	*n*	
1	C_{11}	C_{12}	…	C_{1j}	…	C_{1n}	a_1
2	C_{21}	C_{22}	…	C_{2j}	…	C_{2n}	a_2
…	…	…	…	…	…	…	…
i	C_{i1}	C_{i2}	…	C_{ij}	…	C_{in}	a_i
…	…	…	…	…	…	…	…
m	C_{m1}	C_{m2}	…	C_{mj}	…	C_{mn}	a_m
	b_1	b_2	…	b_j	…	b_n	

The cost of locomotive-kilometers for the movement of a shunting locomotive from a cargo object in excess to a cargo object with a deficiency are expressed by products $c_{ij}x_{ij}$, the cost of locomotive-kilometers for all movements:

$$C = \sum_{i=1}^{m}\sum_{j=1}^{n} c_{ij}x_{ij}. \quad (1)$$

The x_{ij} arguments of this linear function are related as follows. The sum of all movements located in the first row of the matrix (table 1) should be equal to the size of the departure from the first station

$$x_{11} + x_{12} + ... + x_{1j} + ... + x_{1n} = a_1. \quad (2)$$

Equality is the same for all other strings. They make up a system of linear equations:

$$\sum_{j=1}^{n} x_{ij} = a_1, \ (i = 1, \ 2, \ ..., \ m). \quad (3)$$

The sum of movements, reflected in the first column, should be equal to the demand of the first station for locomotives:

$$x_{11} + x_{21} + ... + x_{i1} + ... + x_{m1} = b_1. \quad (4)$$

For all columns, this is a system of linear equations:

$$\sum_{i=1}^{m} x_{ij} = b_j, \ (j = 1, \ 2, \ ..., \ n). \quad (5)$$

The solution to the problem makes sense only for positive values:

$$x_{ij} \geq 0\,,\ (i=1,\ 2,\ ...,\ m;\ \ j=1,\ 2,\ ...,\ n)\,. \qquad (6)$$

Thus, in general, the transport problem of linear programming based on the Simplex solution method is formulated as follows: it is necessary to minimize the linear function:

$$C=\sum_{i=1}^{m}\sum_{j=1}^{n}c_{ij}x_{ij}=\min \qquad (7)$$

with nonnegative arguments related to the system of linear constraints (8), which include equalities (3) and (5).

$$\left.\begin{array}{l}\sum\limits_{j=1}^{n}x_{ij}=a_i,\ (i=1,\ 2,\ ...,\ m);\\ \sum\limits_{i=1}^{m}x_{ij}=b_j,\ (j=1,\ 2,\ ...,\ n).\end{array}\right\}. \qquad (8)$$

Results and discussion

Microsoft Excel is used to solve the problem. We set the initial data.

1. We write down the distances between cargo objects, as shown in Table 2, and deliberately large values (11111) are written on the diagonal to exclude zero distances from the calculation (for example, loading-unloading front 1 - loading-unloading front 1).

2. In table 3, we describe shunting locomotives for cargo objects, which can be used to ensure shunting work. For example, at stations 5-LUF, 6-LUF and 10-LUF (LUF – loading-unloading front) there is one redundant locomotive each, and at cargo sites 3-LUF, 4-LUF, one locomotive is missing. Since the excess number of shunting locomotives (3) and their insufficient number (2) are not equal to each other, then to bring the task to a closed form, we set a fictitious cargo object (the shunting locomotive remains at the end of work, waiting for a command to operate them).

Table 2.

Distances between cargo objects

Cargo objects with surplus locomotives	Cargo objects that need locomotives									
	1-LUF	2-LUF	3-LUF	4-LUF	5-LUF	6-LUF	7-LUF	8-LUF	9-LUF	10-LUF
1-LUF	11111	500	200	1000	900	1200	1500	480	240	900
2-LUF	1200	11111	800	400	250	700	490	600	780	520
3-LUF	280	900	11111	640	570	480	950	1300	400	500
4-LUF	500	700	600	11111	470	600	750	420	370	460
5-LUF	800	700	420	760	11111	570	680	740	450	640
6-LUF	500	800	800	470	900	11111	290	780	650	210
7-LUF	900	250	700	650	600	600	11111	650	450	560
8-LUF	400	640	450	720	450	650	640	11111	250	920
9-LUF	380	280	580	340	740	540	570	390	11111	1010
10-LUF	470	370	640	450	260	220	600	420	720	11111

Table 3.

Distribution of locomotives by cargo objects

Cargo objects with surplus locomotives	Lack of the shunting locomotives										Total	Total locomotives awaiting work
	1-LUF	2-LUF	3-LUF	4-LUF	5-LUF	6-LUF	7-LUF	8-LUF	9-LUF	10-LUF		
1-LUF	0	0	0	0	0	0	0	0	0	0	0	0
2-LUF	0	0	0	0	0	0	0	0	0	0	0	0
3-LUF	0	0	0	0	0	0	0	0	0	0	0	0
4-LUF	0	0	0	0	0	0	0	0	0	0	0	0
5-LUF	0	0	0	0	0	0	0	0	0	0	0	1
6-LUF	0	0	0	0	0	0	0	0	0	0	0	1
7-LUF	0	0	0	0	0	0	0	0	0	0	0	0
8-LUF	0	0	0	0	0	0	0	0	0	0	0	0
9-LUF	0	0	0	0	0	0	0	0	0	0	0	0
10-LUF	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	0	0	0	0		
Total cargo objects in need of a shunting locomotive	0	0	1	1	0	0	0	1	0	0	$C=\sum_{i=1}^{m}\sum_{j=1}^{n}c_{ij}x_{ij}=\min$	

At cargo facilities with an equal number of trains and locomotives (a closed-type problem), 0 locomotives are set to exclude them from the calculation. For example, at stations 5-LUF, 6-LUF and 10-LUF (CO-cargo object) there is one redundant locomotive each, and at cargo sites 3-LUF, 4-LUF and 8-LUF, one locomotive is missing. Then we continue according to the second option.

3. Start the procedure for finding a solution, as shown in Figure 1.

4. In the window **Search for a solution**, select the **Run** command.

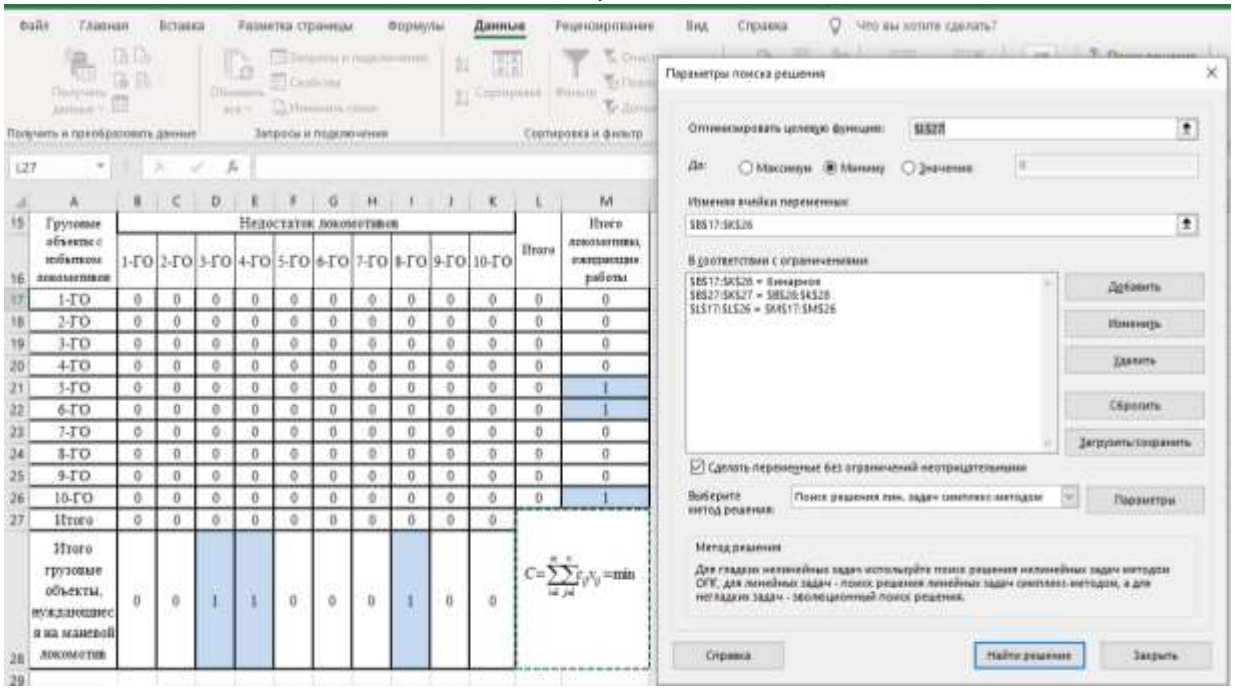

Figure 1. Procedure for finding a solution

5. Instead of the values recorded in Table 3, the values of the rational plan for the regulation of shunting locomotives appear, presented in Table 4. It can be seen from Table 4 that the shunting locomotive waiting for work in the 5-LUF is sent to the 3rd, in the 6th to the 4th CO and 10-LUF to 8-LUF. The total mileage of shunting locomotives is 1310 locomotive-kilometers.

Changing the distances between cargo objects from 5-LUF to 3-LUF, 6-LUF to 4-LUF, 10-LUF to 8-LUF from 420, 470, 420 to 900, 200, 1100, respectively, you can get another rational regulation plan shunting locomotives (table 5). From table 5 it can be seen that a shunting locomotive waiting for work in the 5th CO is sent to the 8th CO, to the 6th CO to the 4th CO (remains) and the 10th CO to the 3rd CO. The total mileage of shunting locomotives is 1580 locomotive-kilometers.

Table 4.

Rational plan for the regulation of shunting locomotives

Cargo objects with surplus locomotives	Lack of the shunting locomotives										Total	Total locomotives awaiting work
	1-LUF	2-LUF	3-LUF	4-LUF	5-LUF	6-LUF	7-LUF	8-LUF	9-LUF	10-LUF		
1-LUF	0	0	0	0	0	0	0	0	0	0	0	0
2-LUF	0	0	0	0	0	0	0	0	0	0	0	0
3-LUF	0	0	0	0	0	0	0	0	0	0	0	0
4-LUF	0	0	0	0	0	0	0	0	0	0	0	0
5-LUF	0	0	1	0	0	0	0	0	0	0	1	1
6-LUF	0	0	0	1	0	0	0	0	0	0	1	1
7-LUF	0	0	0	0	0	0	0	0	0	0	0	0
8-LUF	0	0	0	0	0	0	0	0	0	0	0	0
9-LUF	0	0	0	0	0	0	0	0	0	0	0	0
10-LUF	0	0	0	0	0	0	0	1	0	0	1	1
Total	0	0	1	1	0	0	0	1	0	0		
Total cargo objects in need of a shunting locomotive	0	0	1	1	0	0	0	1	0	0	1310	

Table 5.

Rational plan for the regulation of shunting locomotives after changing the distances between cargo objects

Cargo objects with surplus locomotives	Lack of the shunting locomotives										Total	Total locomotives awaiting work
	1-LUF	2-LUF	3-LUF	4-LUF	5-LUF	6-LUF	7-LUF	8-LUF	9-LUF	10-LUF		
1-LUF	0	0	0	0	0	0	0	0	0	0	0	0
2-LUF	0	0	0	0	0	0	0	0	0	0	0	0
3-LUF	0	0	0	0	0	0	0	0	0	0	0	0
4-LUF	0	0	0	0	0	0	0	0	0	0	0	0
5-LUF	0	0	0	0	0	0	0	1	0	0	1	1
6-LUF	0	0	0	1	0	0	0	0	0	0	1	1
7-LUF	0	0	0	0	0	0	0	0	0	0	0	0
8-LUF	0	0	0	0	0	0	0	0	0	0	0	0

9-LUF	0	0	0	0	0	0	0	0	0	0	0	0
10-LUF	0	0	1	0	0	0	0	0	0	0	1	1
Total	0	0	1	1	0	0	0	1	0	0	1580	
Total cargo objects in need of a shunting locomotive	0	0	1	1	0	0	0	1	0	0		

Conclusion

1. A method has been developed for the operational regulation of shunting locomotives at railway stations based on the Simplex solution method in order to minimize the reserve mileage of shunting locomotives and automate the effective decision-making.
2. In the developed method, the minimum reserve mileage of shunting locomotives is taken as a criterion of rationality and it shows the possibility of effective application of the Simplex method in solving problems typical for transport processes in organizing shunting operations at main line and industrial railway stations.
3. On the basis of this method, the operating personnel of the railway station will be able to develop a technology for orderly regulation of the operation of shunting locomotives serving cargo facilities for each planning period.

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EFFECT OF DISCRETE DRUM CONSTRUCTIVE ELEMENTS ON PRODUCT QUALITY INDICATORS

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Annotatsiya. Pnevmomexanik yigirish mashinalaridagi diskretlovchi barabancha ish unumdorligini oshirish va toladagi chang miqdorini samarali ajratib olish maqsadida ikki kirimli tishli garniturali va qayishqoq vtulkali diskretlovchi barabancha qo'llanilgan. Ushbu maqolada tavsiya etilgan diskretlovchi barabancha olingan ipni sifat ko'rsatkichlari tadqiq etilgan.

Kalit so'zlar: garniturali baraban, tishli garnitura, tashqi vtulka, shkiv, tishli o'ram, shlitsali birikma, arrasimon garnitura, qayishqoq vtulka.

Аннотация. Для повышения эффективности дискретизирующего барабана пневмомеханических прядильных машин и эффективного удаления пыли в

волокне использовался дисковый барабан с двухзаходным зубчатым гарнитурам и упругой втулкой. В данной статье исследуются качественные характеристики пряжи, полученной из рекомендованного произвольного барабана.

Ключевые слова: барабан гарнитуры, зубчатая гарнитура, внешняя втулка, шкив, зубчатая втулка, шлицевое соединение, пиьчатая гарнитура, упругая втулка.

Annotation. This article examines the quality characteristics of yarns made from the recommended random drum. This article examines the quality characteristics of yarns made from the recommended random drum.

Keywords: headset drum, gear headset, external screwdriver, screwdriver, gear roller, slit attachment, arrays-type headset, flexible helmet.

Introduction. Currently, the textile industry is one of the most promising sectors of the economy, plays an important role in the Republic of Uzbekistan and occupies a significant share of employment, a significant share in the production of finished industrial products and consumer goods from local natural fiber blends.

The main factors in increasing the economic potential of the country is to increase the efficiency of production of finished products from a mixture of local natural fibers. The Action Strategy for the Development of the Republic of Uzbekistan for 2017-2021 sets the task of "increasing the competitiveness of the national economy ..." [1].

Analysis of the literature on the subject. One of the main processes in pneumomechanical spinning is the separation of the fibrous mass complex into separate fibers using a sampling device.

The discretion drum consists of a supply table mounted on a compaction funnel. The fibrous wick passes through this compaction funnel. The table is compressed into a supply cylinder by means of a spring, resulting in the required tension at the level at which the discreting drum pulls[2]. The supply cylinder transmits the pile to a discrete drum with a gear set. The diskette drum teeth separate the continuous fiber stream into separate fibers and clean the fibers from waste defects. The fibers coming out of the supply pair are separated from the impurities and removed by the drum heads. As the drum rotates, the waste is transported to the waste separation channel, and the fibers are routed along the transport channel to the working surface of the spinning chamber. In this case, the fiber itself is oriented and straightened during movement.

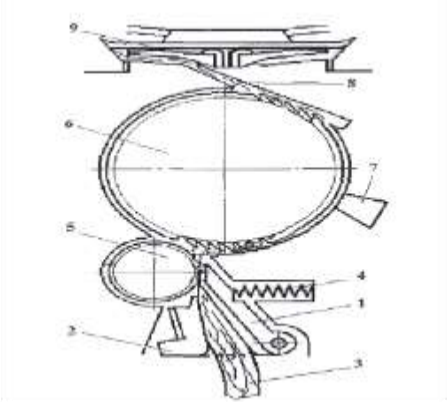

Figure 1. Discretizing device

The cleaning of the fibers from contaminants is directly related to the design parameters of the waste suction channel of the spinning device. The disadvantage of the sampling process is that due to the quality of the cocoon, the fibers cannot titrate well enough, the fibers are mechanically damaged, their shrinkage is observed, and the spun fibers are separated into waste. This reduces the quality and strength of the yarn[3].

In the spinning industry, sampling drums wrapped mainly in celnometal gears are used to carry out the sampling process. Let's take a look at the effect of the discrete drum headset on the fiber bundle.

According to the study [4], no break is observed if the distance from the compression line of the fiber pile to the teeth of the discrete drum headset is equal to 1/4 of the length of the processed fiber. The depth of immersion of the headset teeth depends on the surface profile that holds the fiberboard in place.

This surface profile is eccentric to the surface of the discrete drum, allowing the protruding pellet to increase its size under the action of a flexible force, while at the same time reducing the impact of the discrete drum headset teeth. The use of such protective surface profiles allows combing the fiber bundle along its entire length. This in turn increases the ability to clean headsets [5,6].

Ashnin N.M. [7] noted in their work that fiber properties depend on headset parameters. He found a correlation between headset parameters and fiber properties. The most important of these are tooth density, pitch, and slope angle. According to the author, it is recommended to increase the tooth density and the angle of inclination for better grinding of the fibers. Sevostyanov A.G. notes that the degree of friction and thinning of the fibrous product play an important role in the structure of the yarn, the flattening of the fibers. The ingress of sufficiently finely crushed fibers into the rotor jelly leads to a breakdown of the fibrous fiber in it and its structure.

German scientists Gerd and Peuter [8] found from the sampling process of pneumomechanical spinning machines that the force acting on the fiber does not change in practice with increasing the speed of the sampling drum from 5,000 to 9,000 rpm, but changes with increasing head height and slope angle from negative to positive. That is, it can be added that as the discretion drum speed increases, an increase in the amount of waste collected in the chamber jelly is observed. Contamination of the chamber leads to a decrease in the strength of the yarn and an increase in its fluff. The tips of the teeth are edged so that the headset teeth fit well into the fibrous tuft. Depending on the conditions of operation and preparation of the headset, there will be areas at the tooth tips that create the conditions for the reaction generated by the fibrous product.

In his research, Stahlecker [9] argues that it is advisable to use discrete drums with a high number of teeth when processing medium-density yarns.At the same time there is a decrease in roughness in the yarn. This is explained by the flat placement of the fibers on the drum surface.

From the above research, it can be concluded that in the analysis of headsets it is positive to study them together with the fiber property (e.g. fiber length, front edge slope angle, tooth pitch and x, .k.).Merkulova T.A. In [10,11] studies, the percentage of adhesion in the more accurate assessment of the technological properties of headsets

was considered high.The world's leading companies are designing new types of headsets to continuously improve the mechanisms and components of pneumatic spinning machines, to increase their speed, taking into account the range of fibers used and the products obtained from them.

The authors studied the effect of additional wetting of fibrous materials during pneumomechanical spinning.

Moistening the fibers in the supply zone has a great effect on the orientation and flattening of the fibers, improving the appearance of the yarns and increasing their strength. [12] In the study, the author recommended the transfer of saturated steam through an ellipse-shaped hole instead of humid air. As the humidity increases, the breaking strength and elongation of the cotton increases. It also increases the friction force between the fibers.The disadvantage of this method is the reduced shredding and cleaning efficiency in damp fibers, in addition, excessive dampness can lead to rusting of the headset. This can lead to a decrease in product quality.The author [13] recommended a device that strengthens the pile and connects the loop to the causes of technological processes in the supply zone and to eliminate it. The analysis revealed that the study of microprocesses at the sampling node is recommended.

Research methodology. The STATIMAT-C tool determines the tensile strength and elongation at break. In this case, the humidity in the room is $60 \pm 5\%$and the temperature is 20 ± 3^0C. Before starting work, first the machine, then the computer program is started. Yarns with a tensile strength greater than 100 H cannot be tested on this machine. This device is powered by a compressor.

Up to 10 samples can be installed on the machine at once.

Workshop refueling is done through routers. Before starting, it is necessary to remove the water from the filter of the air compressor in the machine. The data is entered into the machine: how many times to experiment with each sample; breaking force; distance between clamps; number of samples; the name of the running operator is entered. Then press the Cont (start) button. The results are automatically output from the printer. The broken threads fall into the box using a compressor. The linear density of the yarns is determined on a special weighing wheel HM-3 and SK-60H. During the experiment, the humidity in the room should be $60 \pm 5\%$ the temperature 20 ± 3^0C. The diameter of the HM-3 spinning wheel is 1.25 cm. Before starting the wrapping, the display of the appliance must be “0”, otherwise the “RESET” button must be pressed. After setting the thread on the wheel, the start button is pressed. It is possible to get 3 yarns at a time on the yarn wrapping wheel.The obtained yarns are weighed on a special scale "SK-60H" [13]. When starting the scale, do not start the experiment until "0.0" appears on the display.The scales allow the mass or direct linear density of the sample to be determined. The linear density of the sample is measured on this scale in the Japanese system. In the SI system, the text is multiplied by 9 to get it.

This device allows the fibrous material to be discrete at a uniform rate and increase efficiency

Analysis and results. On the surface of the sampling drum is mounted a set of saws made of solid metal. It is made in the form of an external bushing mounted on the base of the cylinder by means of a flexible bushing.The inner surface of the gear headset and the outer surface of the outer bushing are made in a curved shape, the

height of the intermediate headset between them is greater than the height of the teeth at its edges by 0.4-0.6 mm, the difference between the diameters of the middle heads and drums Dd = 8-1.2 mm, where the diameter of the drum obtained along the edges of the intermediate headset, d - the diameter of the drum obtained along the middle of the intermediate headset, where the flexible and outer bushings are connected to each other by a slotted joint [14].

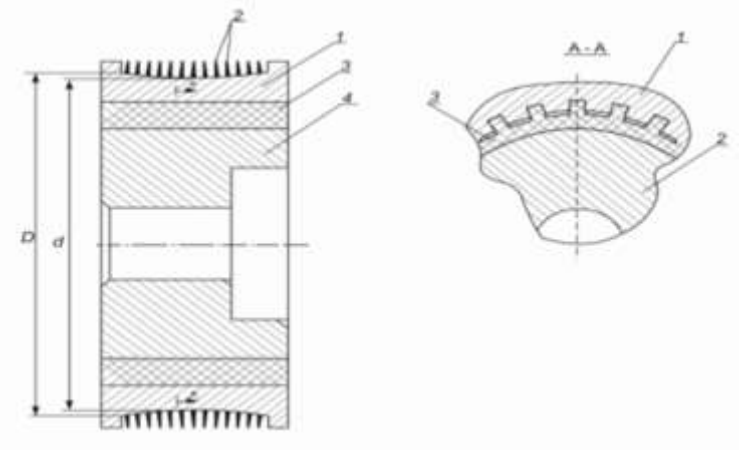

Figure 1. Discrete drum with a flexible screwdriver.

The diagrams generated by striping yarn by three different threads are shown in Figure 2 below at the rotation frequency of the discrete drum 6500 min^{-1}.

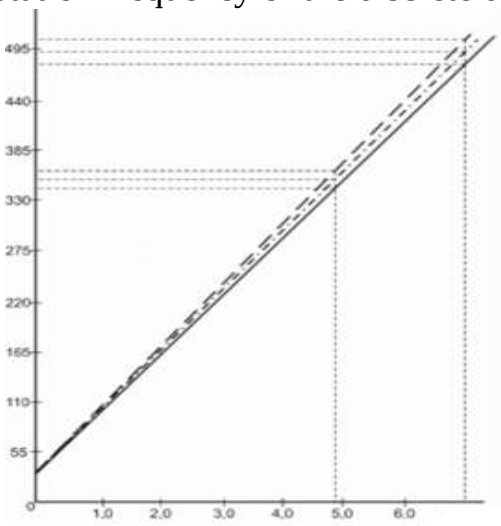

Figure 2. Influence of rope elongation on tensile strength in discrete drums

As can be seen from Figure 2 and Table 1, the length of the yarn formed in the form of a double-stranded package is slightly longer, which makes it more important in yarn processing technology, as the yarn is first stretched to a certain value and then tension is generated under its influence. does.

The voltage is 9.19 sN/ tex at 5% elongation of two-threaded headset yarns, 8.6 gs / tex at single-threaded windings, and 8.1 sN / tex at two-threaded machines with flexible bushings.

The importance of the cutting work is determined by weighing in subsequent processing and in the course of the technological process. It then affects the successful processing of the yarns and the modulus of elasticity.

It can be observed that this is even faster when it returns to its original state after a short period of loading.

Depending on the rotational frequency of the discretion drum, the elastic bushing is 149.7-158 in two-winding windings and 158.5-159.6 in two-winding windings.

Relaxation time after short-term loading is 5.35-5.31 s in single-input windings, 4.69-4.84 s in two-input windings with flexible bushings, and 4.84-5.52 s in two-input windings.

As the impact intensity of the discretion drum increases, the rope stiffness decreases (Table 1).

Table 1

Extreme and asymmetric values

Name of the indicator	3 lucrative package		
	6000	6500	7000
Exercise	2,44	2,30	2,47
Asymmetry	-3,27	0,04	-4,22

The yarn extraction of all variants is between 2.3 and 2.5 which is characteristic of pneumatic spinning yarn.

In conclusion. It will play an important role in yarn processing technology. The string is initially stretched to a certain value and generates tension. The voltage is 9.19 sN /tex at 5% elongation of two-threaded headset yarns, 8.6 gs/tex at single-threaded windings, and 8.1 sN/ tex at two-threaded machines with flexible bushings.

In conclusion, a positive asymmetry is observed in double-input flexible bushings with a single-input winding and a rotational frequency of 7000 min^{-1} and a rotational frequency of 6500 min^{-1}, 7000 min^{-1}.

It can be said that the positive asymmetry is observed in two-welded roller coils with a single-input roll, with a rotational frequency of 7000 min^{-1} and a rotation frequency of 6500 min^{-1} and 7000 min^{-1}. This indicates a high level of fiber flow resulting from improved discretization results. It can be concluded that deformation is of great importance for yarn processing technology.

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UDK 620.98

CREATION AND RESEARCH OF ENERGY-SAVING INVERTERS USED IN A MICRO-HPP

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Annotatsiya: Ushbu maqolada mikro-GESning bir qismi sifatida ishlatilganda yuqori samaradorlikka ega bo'lgan inverterlar uchun nazorat tizimlarini eksperimental o'rganish natijalari, elektr stansiyasining chiqish kuchlanishini barqarorlashtirish uchun statik chastotali konverterga ega bo'lgan gidroelektrik birlik keltirilgan.

Kalit so'zlar: muqobil, energiya manbai, mikro-gidroelektr stansiya, inverter, barqarorlashtirish, chiqish kuchlanishi, aylantirish, samaradorlik.

Аннотация: Представлены результаты экспериментальных исследований систем управления инверторами с высокой эффективностью при использовании в составе МИКРОГЭС гидроагрегата со статическим преобразователем частоты с целью стабилизации выходного напряжения электростанции.

Ключевые слова: альтернатива, источник энергии, микрогидроэлектростанция, инвертор, стабилизация, выходное напряжение, преобразование, эффективность.

Abstract: The results of experimental studies of control systems for inverters with a high efficiency when used as part of a Micro-HPP, a hydroelectric unit with a static frequency converter in order to stabilize the output voltage of a power plant are presented.

Keywords: alternative, energy source, micro-hydroelectric power station, inverter, stabilization, output voltage, conversion, efficiency.

Introduction. Alternative energy sources are constantly existing energy resources of natural processes, as well as waste products of biocenoses of plant and animal origin. A feature of alternative energy sources is their non-depletion, as well as the ability to restore their potential in a certain time. Alternative energy sources (AES) include the following types: solar energy, hydropower, geothermal, wind, sea wave and current energy, biomass energy and low potential thermal energy.

The main advantage of AES, which determines the interest in them, are: renewability, inexhaustibility; ecological cleanliness; availability, availability of one or another source. Along with the listed advantages, AES have the following disadvantages: low energy flux density, which affects the dimensions of power plants, and, consequently, their cost.

One of the main issues today is the creation of energy-saving devices that are economical in terms of technical and economic characteristics, used in practice. This requires the revision of existing devices, as well as the study of modern options for various design schemes.

Literature review. In this article, the author presents the results of a study of inverter control systems with high efficiency when using alternative energy sources in order to stabilize the output voltage of a power plant, based on an analysis of the inverter circuit diagrams.

The main efforts in the development of Micro-HPP are aimed at improving the systems for stabilizing the output voltage of the power plant, which makes it possible to use the most simple and cheap hydraulic equipment. For Micro-hydroelectric power plants operating in a free flow of water, stabilization systems are required that control at least two parameters of the output voltage: its value and frequency[1].

If it is necessary to convert an alternating or direct voltage of one rating into an alternating or direct voltage of a different rating, converters are used. This research work was studied by the following scientists: N.K.Govind[2], J.Shrestha and M.Byanjankar[3], R.A.Zakhidov[4] and others.

Converters are divided into two types. Converters that convert DC power to AC power are called inverters, and the conversion process consists of inverting.

If a constant voltage is required at the output of the converter, a rectifier and a filter are installed after the converter. A converter that converts one AC voltage to another AC voltage is called a converter, and the conversion process consists of converting [5].

The use of a hydroelectric unit with a static frequency converter as part of the Micro-HPP completely removes the problems with the quality of the output voltage and makes it possible to increase the utilization factor of its installed capacity. The principle of operation of the generating system consists in converting the voltage of a hydrogenerator with an unregulated turbine, unstable in magnitude and frequency, into direct current using a rectifier, followed by inverting by the inverter into alternating current of a stable frequency. To optimize the energy balance of the system, it is possible to use electric energy storage devices - more often electrochemical batteries [6].

Research methodology. In Micro-hydroelectric power station, the generator part, which consists of an asynchronous motor and a generator mechanically connected to it, the inverter is designed to power the motor, the built-in inverter controller provides the specified motor rotation speed by changing the output voltage frequency[7].

The advantages of such a Micro-hydroelectric power station are the high quality of the output voltage, determined by the inverter, and the ability to work under conditions of changing parameters of the working water flow.

High efficiency inverter design

Based on the experiments carried out, it can be noted that the overall efficiency of inverters can be increased by reducing the stages of the conversion process.

Therefore, in order to create an inverter with a high efficiency, the step of the modification process in the inverter must be shortened[8].

A block diagram of a similar inverter is shown in the following figure.

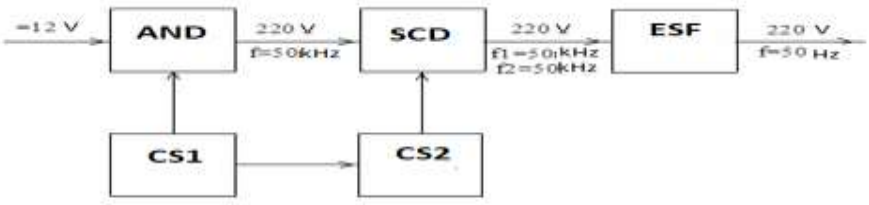

Figure 1. Block diagram of a high efficiency inverter

Here: AND - input inverter; SCD - a switch that controls the direction of currents; CS1 - input inverter control system; CS2 - switch control system that controls the direction of currents; ESF - energy storage filter.

Analysis and results.

As seen in the high efficiency inverter block diagram, the inverter replacement process is a two-step process (Figure 1).

In this case, the overall efficiency of the inverter is determined as follows.

$$\eta_{total} = \eta_I \times \eta_{SCD} \quad (1)$$

Where: η_i- input inverter efficiency; η_{SCD} - efficiency of a switch controlling the direction of currents.

Since the current control switches operate in the same pulse saturation mode as the input inverter switches[9], their efficiency can also be assumed to be equal to that of the input inverter, that is η_{SCD}=0.9.

In this case, the efficiency of inverters, consisting of two stages of the conversion process, is as follows.

$$\eta_{total} = 0.9 \times 0.9 = 0.81 \quad (2)$$

If we compare the efficiency of the developed inverter with the efficiency of the RFA-1000 converter, then the gain in the efficiency of the developed converter will be as follows.

$$\eta_{total} = \eta_{i1} - \eta_{i2} \quad (3)$$

that is,

$$\eta_{total} = 0.81\text{-}0.729 = 0.081 \quad (4)$$

This means that a one-step reduction in the conversion process in the inverters will increase the efficiency of the inverters to 0.081.

The graph of the dependence of the efficiency to power is shown in Figure 2.

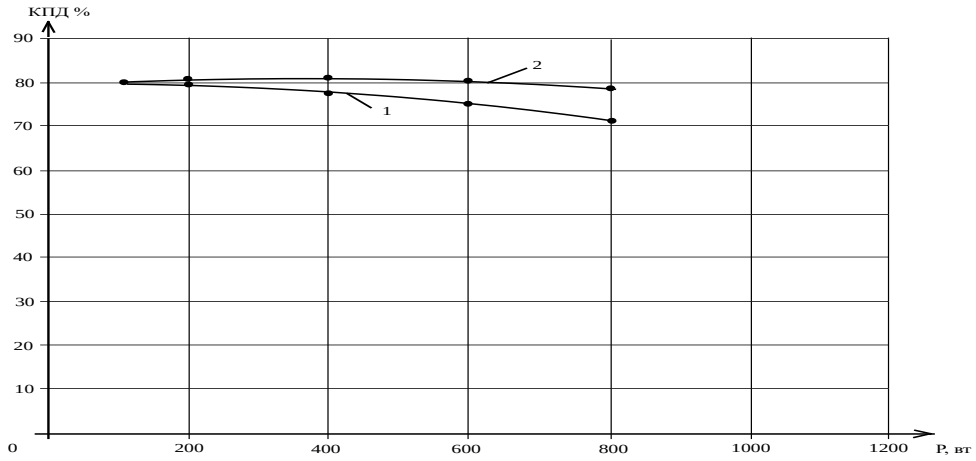

Figure 1. The graph of the dependence of the efficiency to power

The principle of operation of a highly efficient inverter is as follows.

Conclusion. The input inverter is connected to a DC source with an input voltage of 12 volts. In this case, the input inverter converts 12 volts DC to 50 kHz AC and 220 volts[10]. The alternating current generated in the input inverter is specially converted by the control switch in the direction of alternating currents into alternating current with a frequency of 50 Hz, and each half-cycle is filled with a pulse with a frequency of 50 kHz. The resulting alternating current is grounded in the PUN energy storage filter and converted to pure 50 Hz alternating current.

Thus, the efficiency of these inverters, which can be used in hydropower systems, has been increased to ηtotal = 0.81.

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USE OF FOUR-STROKE LIFTING CONVERTERS IN TRACKING SYSTEMS OF SOLAR PLANTS

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Annotatsiya: Maqolada kam quvvatli quyosh energiyasi qurilmalarining samaradorligini oshirish masalalari muhokama qilingan bo'lib, bu kam quvvatli to'rt zarbli ko'tarish keng impulsli quyosh elektr stansiyalarida doimiy yuqori quvvatni ta'minlash natijalarini ko'rsatadi. Ish jarayonida kam quvvatli quyosh elektr stansiyalarining turlari va elementlari tahlil qilinib, ushbu ma'lumotlar asosida kompyuter modeli ishlab chiqildi. Quyosh elektr stansiyasining chiqish kuchlanishining quyoshning holatiga qarab o'zgarishi natijalari, 120 Vt quvvatga ega MCW seriyasidagi quyosh modulining tok-kuchlanish xarakteristikasi keltirilgan.

Kalit so'zlar: quyosh energiyasi, quyosh qurilmalari, energiya ta'minoti, mahalliy inshootlar, samaradorlikni oshirish, quyosh elektr stansiyalari, kompyuter modeli, matematik model.

Аннотация: В статье рассматриваются вопросы повышения эффективности солнечных энергетических устройств малой мощности, в которых показаны результаты обеспечения постоянной высокой мощности в солнечных электростанциях малой мощности с четырехтактным подъемом широкими импульсами. В ходе работы были проанализированы типы и элементы солнечных электростанций малой мощности, и на основе этих данных была

разработана компьютерная модель. Приведены результаты изменения выходного напряжения солнечной электростанции в зависимости от положения солнца, вольт-амперной характеристики солнечного модуля серии MCW мощностью 120 Вт.

Ключевые слова: солнечная энергия, солнечные устройства, энергоснабжение, локальные объекты, повышение эффективности, солнечные электростанции, компьютерная модель, математическая модель.

Abstract: The article discusses the issues of increasing the efficiency of solar energy devices of low power, which shows the results of providing constant high power in solar power plants of low power four-stroke lifting wide pulses. In the course of the work, the types and elements of low-power solar power plants were analyzed, and a computer model was developed on the basis of these data. The results of the change in the output voltage of the solar power plant depending on the position of the sun, the current-voltage characteristic of the solar module of the MCW series with a power of 120 W.

Keywords: solar energy, solar devices, energy supply, local facilities, efficiency improvement, solar power plants, computer model, mathematical model.

Introduction. Due to the low energy density of solar radiation, it is desirable to use an optical concentrator of solar radiation in almost many types of solar installations.

At present, the problem of using concentrators is to solve the problems of increasing their optical efficiency and ensuring economic profitability in operation.

One of the technical problems when using concentrators is to ensure its turns following the apparent movement of the Sun during the day, continuously or discretely.

Literature review. The complexity of solving the problem is due to the fact that, due to the low energy density of solar radiation, to obtain the required power, significant areas of solar installations are required, including concentrators, the dimensions of which are proportional to the power of the solar installation.

This leads to the need to solve complex technical problems of creating large-sized concentrators, creating rotary bearings for concentrators and control systems that ensure the movement of such objects following the visible movement of the Sun.

In this regard, as well as the tasks of increasing the efficiency of existing concentrators and heliostats, this article presents aspects of increasing tracking systems, in particular, a Matlab computer model of the power supply system of a local object has been developed, containing an active load and lifting wide pulses of a solar power plant [1]. This research work was studied by the following scientists: foreign scientists M.L. Belov, S.V. Berezin, V.A. Gorodnichaev, V.I. Kozintsev[2] and national scientists Gulyamova F.S., Akbarova D.M., Kosimova K.M.[3], Mamasidikov Y.[4] and others.

Reduction of traditional fuel reserves and environmental pollution during their combustion are considered to be the main disadvantages of traditional types of energy carriers. In this regard, in recent decades, energy programs have been developed aimed at the development of alternative energy.

Research methodology. To ensure the general operation of the solar power plant and industrial electrical networks, special converter devices are required. In many cases, actively controlled converters are used in such devices[5]. The output

characteristic of such converters in terms of the quality of electrical energy must comply with modern standards. Actively controlled rectifiers are made according to a three-phase bridge circuit on IGBT transistors with free-wheeling diodes[6]. Voltage from solar panels is applied to its input from a constant voltage converter of lifting wide pulses. (Figure 1).

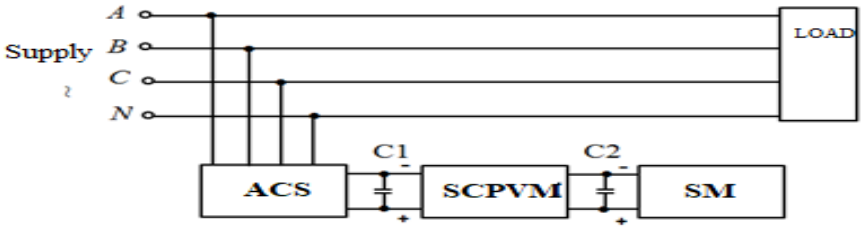

Fig. - 1. Actively controlled rectifier circuit

Block diagram of a solar power plant with a DC voltage converter of lifting wide pulses and an actively controlled rectifier.

Small capacitors C1 are connected to the output of the solar battery. The connected capacitor C2 is selected to the input of the actively controlled rectifier with a high voltage of the peak value of the supply line voltage.

$$Uc > kU_{at}, \quad (1)$$

Where k=1,25 ÷ 1,5.

For stable operation of the converter, it is necessary that C2>>C1.

In a solar power plant with a power of 100 kW, the use of a converter of lifting wide pulses of direct voltage makes it possible to reduce the number of solar cells connected in series[7] and, as a result, increase the overall efficiency of the solar power plant. The connection diagram of the converter of lifting wide DC voltage pulses to the output of the solar battery is shown in Figure 2.

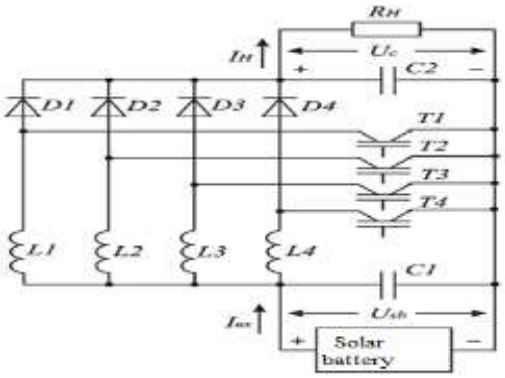

Fig. 2. - Scheme of SCPVM connection to the solar battery output [8]

The SCPVM model shown in Figure 3 is built as follows Figure 3:

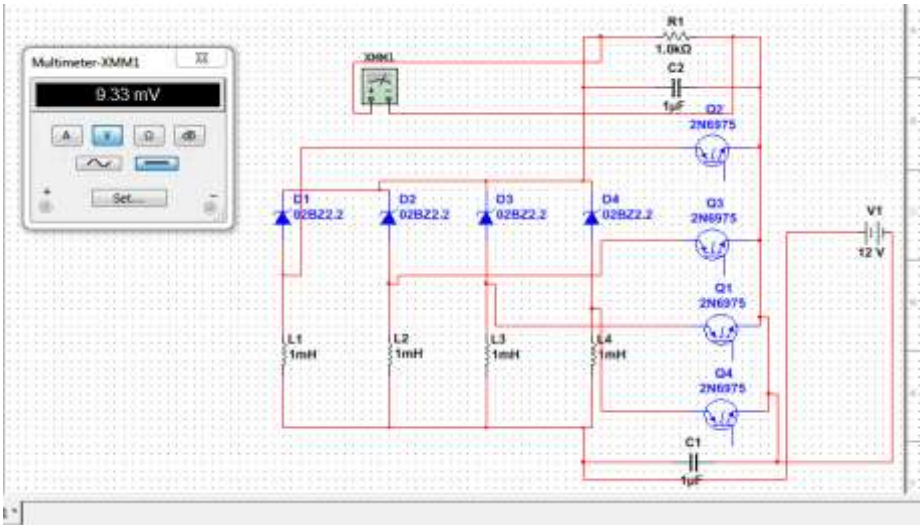

Fig. - 3. The SCPVM model

Here, at sunrise, the multimeter shows 9.33 mV. In accordance with this, with a change in the position of the sun, the angle of the elevator will change[9]. In the model below, you can see an increase in voltage due to a change in the SCPVM angle. It follows from this that with a change in the angular value of the SCPVM, depending on the position of the sun, the voltage value will also change accordingly[10].

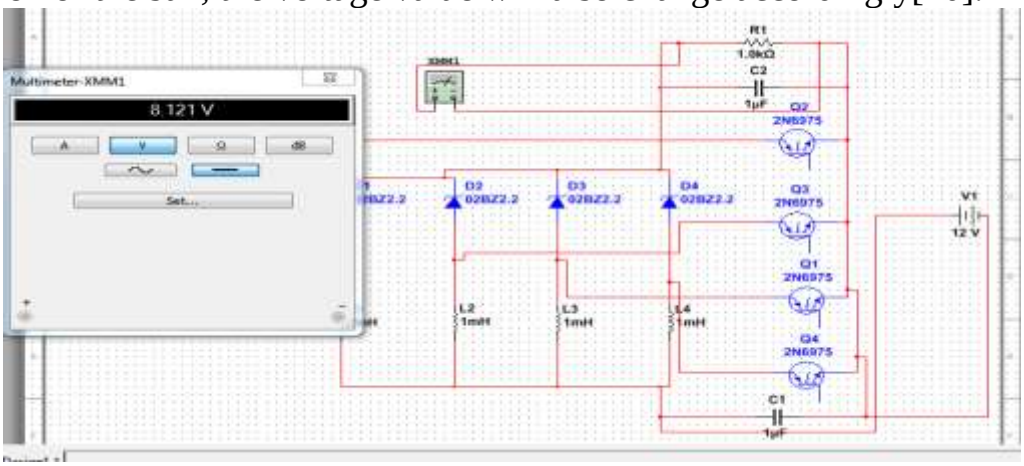

Fig. - 4. Change in the output voltage of the SCPVM depending on the position of the sun

Conclusion. In this regard, the task set in this article to study and ensure constant high powers when using solar cells using four-stroke lifting wide pulses in solar cells is relevant and is of scientific and practical interest.

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UDK 620. 91

ELECTRICAL MATERIALS INSULATION

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Annotatsiya: Ushbu maqolada ta'kidlanishicha, har qanday gaz elektr kuchlanishiga duchor bo'lishidan oldin ham gazda tartibsiz harakatda bo'lgan ma'lum miqdordagi elektr zaryadlangan zarralar - elektronlar va ionlarni o'z ichiga oladi. Har qanday gazda elektr zaryadlangan zarralarning ma'lum soni bo'ladi-elektronlar va ionlar elektr kuchlanishiga duch kelgunga qadar ham gazda tasodifiy harakat qiladi.

Kalit so'zlar: dielektriklar, izolyatorlar, havo qatlami, suyuqliklar, musbat zaryadlar, ionizatorlar, rekombinatsiya.

Аннотация: В этой статье подчеркивается, что любой газ содержит определенное количество электрически заряженных частиц - электронов и ионов, - которые находятся в нерегулярном движении в газе еще до того, как на него подано электрическое напряжение. В любом газе будет определенное количество электрически заряженных частиц - электронов и ионов, которые будут беспорядочно перемещаться в газе еще до того, как он подвергнется воздействию электрического напряжения.

Ключевые слова: диэлектрики, изоляторы, воздушный слой, жидкости, положительный заряд, ионизаторы, рекомбинация.

Annotation: In this article highlights any gas contains a certain amount of electrically charged particles - electrons and ions - that are in an irregular motion in the gas, even before it is subjected to an electric voltage. In any gas there will be a certain number of electrically charged particles - electrons and ions are that will randomly move in the gas even before it is exposed to an electric voltage.

Keywords: dielectrics, insulators, air layer, liquids, positive charge, ionizers, recombination.

Introduction. Gaseous dielectrics include air consisting of a mixture of all gases and water vapor with gases. Most gases are used as dielectrics in gas-filled capacitors, air-high voltage inverters, and other electronic devices. Air surrounds all electrical devices and as a dielectric ensures their reliable operation in many ways[1].

Literature review. The wires of high-voltage power transmission lines attached to the masts using porcelain or glass insulators shall be insulated from each other only from the beginning to the end with an air layer. In a layer of air that directly touches the surface of high-voltage wires, sometimes purple light emanates from the electric crown, which emits a peculiar sound.

Figure 1. An electric crown around an open wire in the air.

Electrical corona occurs when the electrical insulating properties of the air deteriorate or when a very high voltage is applied to the air . In the process of this event, the energy is wasted, so it must be resisted[2].

This research work was studied by the following scientists: foreign scientists Lovegrove K., Burgess G. and Pye J.A. [3], Boldinsky G.I., Yunusov Y.Y.[4] and national scientists Gulyamova F.S., Akbarova D.M., Kosimova K.M.[5], Mukhitdinov M.M.[6] and others.

Gas (air pupae) trapped inside the solid insulation is particularly vulnerable to adverse operating conditions. In successively insulated layers, the electric field strength is distributed inversely proportional to their dielectric constant that is

$$\frac{E_1}{E_2} = \frac{\varepsilon_2}{\varepsilon_1} \qquad (1)$$

Many gas dielectrical absorption (e_1) the only index of the housing (table), a dielectric (e_2), the value of 2 to 8 cha and more name. Therefore, the intensity KA 2-8 times larger than the influence of intensity in the solid insulation of the remaining gases entering the solid insulation. This voltage can ionize the precipitated gas, that is, it can form a large number of electrically charged particles (electrons and ions)[7]. This often leads to tight insulation, resulting in breakdowns of electrical machinery, hardware, cables, and the like**.** Under normal operating conditions, the conductivity of gaseous dielectrics is very low and dielectric losses are low ($\operatorname{tg} d \approx 10^{-6}$).

Analysis and results. Electrical conductivity of gaseous dielectrics

Even before any gas is exposed to an electric voltage , it contains a certain amount of electrically charged particles - electrons and ions, which are in a chaotic motion (thermal motion) in the gas . These can be charged particles of gas, as well as charged particles of solids and liquids - for example, substances mixed with air.

Electrically charged particles in the air are external energy sources of the gas (external ionizers); formed by the ionization of cosmic rays and sunlight, the Earth's radioactive radiation, and so on.

The essence of the ionization process of a gas under the influence of external ionizers is that the ionization wires transfer some of the energy to the gas atoms. As a result**,** the valence electrons have additional energy and are separated from their atoms**,** which turn into positively charged particles — positive ions. The resulting free electrons can move independently in the gas for a long time, or after a certain time they can bind to electrically neutral atomic and gas molecules and convert them into negatively charged ions.

Gaseous dielectrics, the main characteristic 1 - Table.

Dielectric	Density g / cm ^{3}	Dielectric absorption	Electrical strength, MV / m	Heat transfer coefficient *	Heat capacity *
Weather	1.0	1,00057	3.0	1.0	1.0
Nitrogen	0.97	1,00058	3.0	1.08	1.05
Hydrogen	0.69	1,00026	1.8	6.69	14.35
Carbon dioxide	1,529	1,00098	2.7	0.64	0.85
Elegaz	5.03	1.00191	7.2	1.25	0.60

When negatively charged (electrons) and positively charged (ions) particles are in irregular heat, some of them combine to form electrically neutral atoms and molecules of the gas.

If a certain amount of gas is placed between the metal electrodes**,** when the electrodes are energized, the charged particles in the gas are affected by electric forces - electric field strength[8].

Under the influence of these forces, electrons and ions move from one electrode to another, creating an electric current in the gas.

The more charged particles are formed in a gas per unit time, and the faster they move under the influence of electric field forces, the greater the current in the gas[9]. Obviously, as the voltage applied to the same volume of gas increases, so do the electric forces acting on the electrons and ions. This increases the velocity of the charged particles and, consequently, the current in the gas.

The volume of gas, depending on the voltage of the current increase in graphics *volt-ampere characteristics* de frustrated in the form of a curve described in (picture is 2).

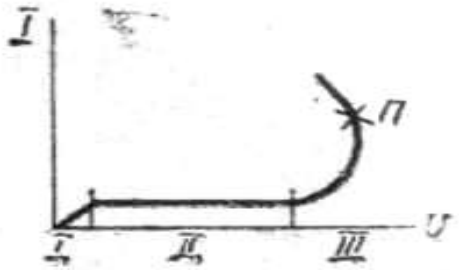

Figure 2. Voltammetric characteristics of a gaseous dielectric

This characteristic shows that in a weak electric field zone, when the

electric forces acting on the charged particles are relatively small, the current in the gas increases in proportion to the applied voltage. The change in current in this zone occurs according to Ohm's law.

Discussion. As the voltage increases further (zone II), the proportionality between the current and the voltage is disturbed. The conductivity in this zone does not depend on the voltage. In this zone, charged particles of gas - ions with electrons - accumulate energy. With a further increase in voltage (zone III), the velocity of the charged particles increases sharply, as a result of which they begin to collide more frequently with the neutral particles of the gas. In such elastic shocks, electrons and ions transfer some of the energy they have accumulated to the neutral particles of the gas. As a result, electrons are released from their atoms. This creates new charged electrical particles: free electrons and ions[10].

Because flying charged particles often hit the atoms and molecules of the gas, new charged particles are formed much faster. In the process of impact ionization in gaseous dielectrics, the magnitude of the specific volumetric resistance of the gas (r *v*) decreases sharply and the angular tangent of dielectric losses (tg d) increases.

Conclusion. Obviously, gaseous dielectrics can only be used at voltages below the voltages at which the shock ionization process occurs. Under such conditions, gases are good dielectrics, their specific volumetric resistance is very large ($r \approx 10^{18}$ Ohm · m), and the angular tangent of dielectric losses is very small ($tg\ d \approx 10^{-6}$).

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CONTROL OF FABRIC SURFACE DEFECTS

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Annotasiya: Maqolada birlamchi qayta ishlash jarayonida matoning texnologik parametrlarini nazorat qilishning dolzarb muammosi yoritib berilgan. To‘qima qobig‘ining intraspotini boshqarish uchun vizual-optik va radiasion usul va qurilmalarning strukturaviy diagrammalari va ishlash prinsipi keltirilgan. Koërsatkichlarning texnologik parametrlarini kuzatish uchun optoelektron usullar va qurilmalar koëproq istiqbolli yekanligi aniqlandi.

Kalit so‘zlar: akslantirishlar, to‘qimalar, nuqsonlar, fotodetektor, o‘lcham, puls, ko‘p kanalli sxema.

Аннотация: Освещена актуальная проблема контроля технологических параметров ткани при их первичной обработке. Представлены структурные схемы и принцип действия визуально-оптических и лучевых методов и устройств для контроля внутри почечной тканевой оболочки. Установлено, что оптико-электронные методы и устройства для контроля технологических параметров со конусов являются более перспективными.

Ключевые слова: отражения, ткани, дефекты, фотоприемник, размер, импульс, многоканальная схема.

Abstract: The current problem of controlling the technological parameters of the fabric during their primary processing is highlighted. The structural diagrams and the principle of operation of visual-optical and radiation methods and devices for controlling the intraspot of the tissue shell are presented. It has been established that optoelectronic methods and devices for monitoring technological parameters of co-cones are more promising.

Key words: reflections, tissues, defects, photodetector, size, pulse, multichannel scheme.

Introduction. Photoelectric methods for detecting fabric surface defects (stains, dirt, banding, integrity violations, etc.) are based on the fact that the reflection coefficient of the fabric surface in the area of the defect, as a rule, differs from the reflection coefficient of the fabric surface without defects[1].

Literature review. Designating the radiation flux incident on the surface of the fabric, Φo and the reflection coefficients of the surface of the fabric without defects and with a defect, respectively, ρo and ρд, it is possible to represent the tissues, when moving from a section of the surface of the fabric without defects to a section of the surface with a defect

$$\Phi = \Phi o\ (1 - \rho д / \rho o)\ \rho o.$$

Thus, the appearance of a sufficiently significant defect in the field of view of the photodetector is accompanied by a change in the illumination of the photodetector, and, consequently, by a change in the voltage level at the output of the circuit of the latter[2].

The level of this voltage, like that of a photodetector illuminated by a stream passing through a moving tissue, even in the case of a complete absence of defects on

the controlled tissue segment, cannot remain strictly constant, because when the tissue moves, the conditions for the reflection of the radiation flux from its surface periodically change due to the fact that the tissue is a more or less complex periodic structure consisting of many threads, the spectral composition of the variable component of the output voltage of the photodetector circuit in the absence of defects in the tissue, which can be considered as noise[3], is determined by the speed of movement of the tissue and its structure.

The ratio between the variable and constant components significantly depends on the ratio between the transverse dimensions of the weft threads, and for complex weaves, between the size of the inhomogeneity of the fabric structure and the field of view of the photodetector along the length. The smaller the field of view of the photodetector, the weaker this noise.

On the other hand, changes caused by a defect in the level of the output signal of the photodetector remain the same with increasing the latter, until their sizes become close to each other. With a further increase in the field of view, the effect of the same defect on the output signal of the photodetector decreases. Therefore, the correct choice of the field of view of the photodetector is important[4].

Experimental part.

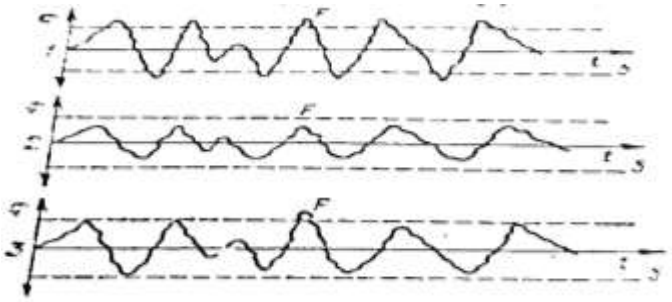

Fig. 1. Cases of photodetector operation

In fig. 1 shows three possible cases: 1) if the field of view of the photodetector is too small, then the level of the signal arising when a defect passes in front of the photodetector is close to the noise level F, and both of them are above the sensitivity threshold of the circuit; 2) if the field of view of both the noise level and the signal level is too large, then it lies below the sensitivity threshold of the system; 3) with a proper choice of the field of view of the photodetector, the signal level lies above the sensitivity threshold, and the noise level is below the signal sensitivity threshold.

Multichannel detection devices defects in the surface of the fabric.

The movement of the tissue in the X direction can be controlled by installing a series of photoelectric sensors located on a straight line perpendicular to the X axis and parallel to the tissue plane. In this case, each photoelectric converter looks at a relatively narrow strip of tissue moving in front of it[5]. Such a multichannel scheme, despite the large number of primary transducers used, is quite simple, does not contain moving elements, and its use for monitoring tissue of any width is not associated with any special difficulties. The simplest multichannel device for detecting holes in tissue is a device consisting of an illuminator and a number of photodetectors (Japanese patent No. 49-16674, class G01N21 / 32). The controlled tissue moves between them so that the radiation flux from the illuminator, passing through the tissue, enters the photodetector.

Therefore, the illumination of the photodetectors periodically changes depending on how many threads and gaps between the threads are at a given moment in front of the input slit of the photodetector. When a hole appears in the tissue in front of this slit, the illumination of the corresponding photodetector increases sharply and the device gives a signal. To reduce the noise level at the output of the photodetector, due to the structure of the fabric, the input slits of the photodetectors are oriented at an angle to the direction of the weft threads of the fabric.

Research methodology. At TsNIHBI, a control unit for inter-workshop sorting of cotton fabrics has been developed. Depending on the number and type of detected defects, this setting classifies the controlled fabric into one of two groups: 1) fabrics suitable for all types of processing; 2) fabrics suitable only for dark dyeing or printing with a dark pattern[6].

This setup uses a series of germanium photodiodes located on a straight line perpendicular to the direction of tissue movement. Each of them, receiving a stream of light reflected from the fabric, controls a narrow strip of its surface. An electroluminescent lamp is used as an illuminator, which evenly illuminates the tissue along its entire width.

Analysis and results. Defects of the tested tissue vary in size and reflectance. To assign a tissue to one or another group, it is necessary to take into account the number and type of detected defects, therefore, 4 different channels for processing the output signal are connected to the output of each photodiode to detect defects of a certain type.

For the detection of defects producing high amplitude pulses, a discriminator followed by a pulse shaper. To detect defects that give weak, periodically repeating pulses, an optimal filter is connected to the photodetector, followed by a threshold device that generates a standard output pulse at a certain voltage at its input.

To detect defects, yes, pulses of small amplitude, but significant duration (defects with a large area, but with little changed reflection coefficient), an integrator is connected to the output of the photodetector, followed by an amplitude discriminator and a pulse shaper[7].

To detect defects that give scattered pulses (randomly scattered small spots, some of which are considered acceptable over a certain segment of tissue length), an amplitude discriminator is connected to the output of the photodetector, followed by an HC storage counter and a pulse shaper.

By the combination of signals at the outputs of these four fabrics, it is possible, in principle, to assess the quality of the tissue using an appropriate logic circuit. For simultaneous monitoring of tissue integrity violations and surface defects, a number of photodetectors are installed on both sides of it and in a direction perpendicular to the direction of tissue movement. Throughout the width of the fabric, a radiation flux is directed to it from the emitter, the length of which is equal to the width of the fabric. The tissue rays reflected from the stream fall accordingly to a group of photodetectors, one of which is used to detect integrity, and the other to detect surface defects in tissue.

When a defect appears in the field of view of one of the photodetectors at the output of the corresponding pair, the difference signal takes on a value other than zero[8]. Deviation from zero value of the output signal of any pair of photodetectors leads to the action of the relay signaling the defect. The largest length of a defect is

determined by the distance between the photodetectors, which form a pair, at the output of which a signal due to this defect appears, so the pairs are made up not from neighboring photodetectors, but from decomposed at a sufficient distance from each other.

Discussion. The device consists of a number of identical channels located one after the other along the width of the controlled tissue. Each channel has a radiation source 4, from which three radiation streams are directed to the controlled tissue 5. The first of them, on the tissue site in the place where it slips, bending over the support 10, forms an illuminated loop 1 mm long in the direction of tissue movement. The radiation reflected by this tissue section enters the photodetector 2, which is used as a cadmium-selenium photocell. This photodetector is used to measure the coefficient of tissue release[9].

The second radiation flux from the source 4 is directed to the mirror 6, from which it is reflected on the mirror 12, casting it onto the photodetector 1. On the way between the mirrors 6 and 12, this radiation flux passes through a narrow slit between the support 10 and the partition 3, along the normal to the plane this slit, partially covered by tissue 11 by the amount of its thickness, therefore the output signal of the photodetector 1 can be used to measure the thickness of the tissue.

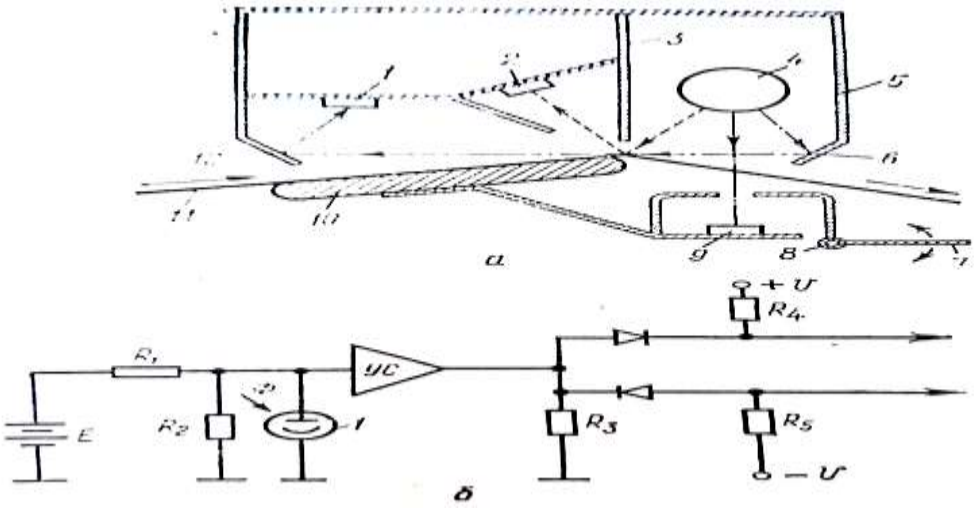

Fig. 2. Functional and schematic diagram of the device

The third radiation flux from source 4 passes through the tissue and enters the photodetector through the slit. The screen can be installed obliquely to the cross-sectional plane of the radiation flux at different angles, turning it around point 8 using the control knob 7. Measuring the effective area of the slit in the screen in this way, it is possible to set up the equipment for monitoring tissues with very different transparency[10].

Identical circuits are connected to the output of each of the photodetectors.

Power supply of photocell 1 with direct current is made through a divider from resistances R1 and R2. The output signal from the resistance R2 is fed to the input of the US amplifier[11].

A load resistance R3 is connected to the output of the amplifier, followed by two branches representing an anti-parallel connection of two diodes[12], each of which is mixed into the circuit, which allows, by changing the values of the resistances R4 and R5, to set the threshold for its unlocking.

Conclusion.

This scheme allows you to set the limits of the tolerance field for the parameter of the fabric.

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LOGICAL SOLUTION OF ASTRONOMIC DECORATIONS OF THE TOMB OF PAKHLOVON MAKHMUD

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Annotasiya. Ushbu maqolada Pahlovon Mahmud maqbarasidagi ravoq qismidagi rutasimon naqsh kompozitsiyasida Pahlavon Mahmudni Yaratganga, Vataniga, xalqiga sadoqatli va vafodor bo‘lganligi hamda, u Xivaning langari ekanligi ramziy ifodalanganligi aniqlandi. Katta moychechaklarni bir tizimda berilishi gallaktikalar tizimini umuman olganda, 18 ming olam ya'ni xozirgi fan tilida metagollaktika tasvirlanganligi aniqlandi va bu xaqida ilmiy farazimiz bayon etilgan.

Kalit so‘zlar: ramz, astrologik bezak, ravoq, langar, moychechak, naqsh, aylana, olam.

Аннотация. В этой статье было установлено, что в композиции узора рута в арке мавзолея Пахловона Махмуда был символически верен и верен своему Создателю, Родине и народу, он был якорем Хивы. Наша научная гипотеза состоит в том, что распределение больших ромашек в одной системе показывает, что всего 18 тысяче вселенных, то есть метаголлактике, были описаны языком современной науки.

Ключевые слова: символ, астрологический орнамент, арка, якорь, ромашка, узор, круг, вселенная.

Annotation. This article, determines the composition of the ruts in the vault of the Pakhlovon Makhmud mausoleum that symbolizes the devotion and dedication of Pakhlavon Makhmud to the Creator, the Motherland and the people, as well as his symbolic name " the anchor of Khiva". Representation of unified large daisies to a single system, system of galaxies, in another words 18000 universes, if it is possible to call it metagalaxia in modern science was detected and we also included our hypothesis.

Калит сўзлар: symbol, astrological ornament, arch, anchor, chamomile, pattern, circle, universe.

The language of enlightenment - is a musical instrument
My mind - is a sword, my word - is an arrow.
The king of privileged property knows that
“Arena" of verbal communication is the place that you occupy.
PAKHLOVON MAKHMUD

Introduction. In recent years,the protection of cultural heritage in the country has risen to the level of state policy, and significant works have been done to restore historical monuments. The strategy of movements for the accelerated development of

our country defines measures for further improvement of urban planning and architecture, solving the problems of preserving and rational use of architectural monuments. "We still have a lot of work to do in preserving and restoring the historical monuments as well as in decorating the tombs of our great ancestors of our country." [1].

The samples of the past are the priceless cultural heritage of the nation. They embody the centuries-old experience of creativity of our ancestors [2]. The unexplained historical mysteries of the architectural heritage are still endless. In particular, one of the important questions is to determine the order of geometric harmony of forms. There is undeniable reason why Abu Ali ibn Sina named his encyclopedia in the field of medicine "Al-Qanun". Abu Raikhan al-Beruni, on the other hand, called his great work on astronomy the Law of Masud. The great philosopher Abu Nasir Farubi conducted research on the scientific nature of the world of thought, society and the laws of nature. The poet and artist Sodigibek Afshor wrote a book on the fine arts "Qanun al-suvor" [2]. Architectural art is a unique and priceless treasure that testifies to different periods of human development. The unexplained historical mysteries of the architectural heritage are still innumerable.

G.A. Pugachenkova, S.M. Bulatov, L.I. Rempel, L.A. Mankovskaya, V.A. Bulatova, V. Voronina, Ya.G. Gulomov, E. Masalsky, I. I. Notkin, P.Sh. Zoxidov and others conducted scientific research works about the history, origin and decoration of mausoleums of architectural monuments of Khorezm.

Main part. The mausoleum of Pakhlavon Makhmud is an architectural monument in Khiva (1810-1913). The total size of the mausoleum complex is 50x30, originally built in 1664 on the grave of Pakhlovon Makhmud. According to the inscription on the gate, Pakhlovon Makhmud was built in 1701 by Shahniyazkhan. In 1825-35. A brick mausoleum (17.5x25.5 m), a shrine (9x9 m) and a khanaka (4x4 m) were erected in its place. Later Khiva khans were also buried here. [3].

The outer dome of the tomb of Pakhlovon Makhmud is decorated with bright blue tiles. The cylindrical part at the bottom of its dome is decorated with a simple geometric pattern of airy color on a white floor (Picture. 1). Ornament creates a light, elegant and dynamic look from a distance [4]. Our scientists L. Mankovskaya and V.Bulatova. In her book "Architectural Monuments of Khorezm" Bulatova gave a general information about the general structure, construction and decoration of the mausoleum of Pakhlavon Makhmud, as well as a scientific study of architectural monuments of Khorezm.

In particular, information is given about the architects, painters and woodcarvers of the Pakhlavon Mausoleum.

So far, the construction of the Pakhlovon Makhmud mausoleum has been studied, but its decorations have not been studied enough. It became clear to us that his ornaments had not been studied at all from the point of view of their symbolic meaning.

1-Picture. Khiva. View of the dome of the tomb of Pakhlavon Makhmud.

Therefore, we tried to artistically analyze some of the patterns in the mausoleum of Pakhlavon Makhmud and determine their logical meaning. First of all, let's talk about the history of Khiva. Built in the style of a Khiva ship. Inhabitants think that the tomb of Pakhlavon Makhmud to be an anchor thrown by Noah in the middle of the city. As long as this mausoleum exists, the city of Khiva will be peaceful. Therefore, the inhabitants keep it like the apple of their eye. Archaeologists proved that the city was built on sand.

The shrine can be accessed through the western door. It contains the grave of Pakhlavon Makhmud. The main buildings of the Pahlavon Makhmud mausoleum were built under the leadership of Odina Muhammad Murad. The decoration was made by Mullah Nurmuhammad the son of Kalandar, Sufi-Muhammad the son of Abdujabbor and Abdullah Jin. The shrine door (1810) and the outer door (1894) were designed by master Nurmuhammad. In 1960, with the participation of master Ruzimat Masharipov, the korikhona (study room of prayers) and the shed were repaired. The mausoleum of Pakhlavon Makhmud is decorated in an airy color scheme, typical for the Khiva school of painting of the 19th century [3].

The roof and vaults of the mausoleum are separated by their majesty and decoration. The dome of the mausoleum differs from other ordinary domes with its high level of decoration: it is elegantly decorated, the walls are decorated with white, blue and green shiny tiles and patterned inscriptions [5]. The famous Khiva painter Abdulla Jinlar recreated the best examples of colored tiles of ancient Khorezm, by creating colorful ornaments. Abdullah Jinny should be mentioned out separately. His friends called him Abdullah Jin because Abdullah jumped like a Jin (demon) in the air and he was the fastest worker. He was used to amaze people with his quick, fluentl and skillfull decorations. (2,3-Pictures).

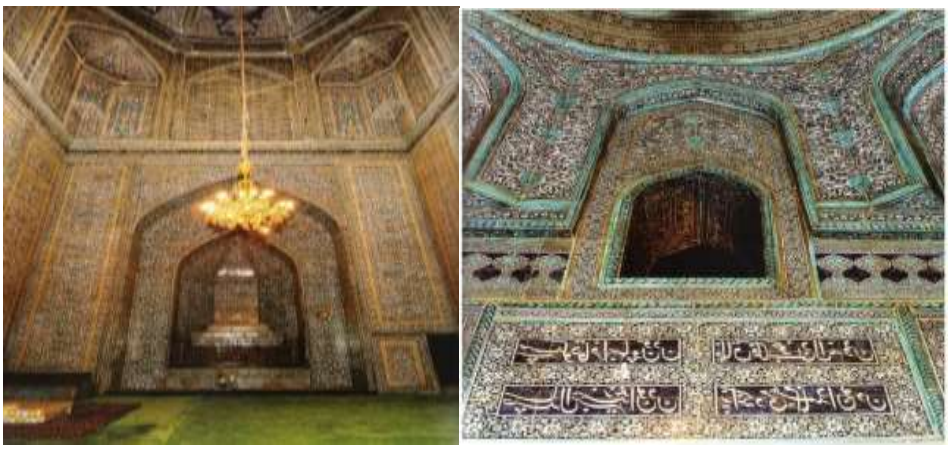
2-Picture. The master who made the patterns for the building ended his work by writing some passages with the letters of suls. Mulla Nurmukhammad ibn Kalandar Khorazmi (1240-1824).

3-Picture. On the western wall of the shrine, two lines of the master's poem are repeated. “The flower of this pattern is an example of spring. This monument was gifted to this world from Abdullah.

Said Nafisi, an Iranian scholar, said: "One of the leaders of the Futuvvat-Juvanmard ideology group is the famous poet Pakhlovon Makhmud Khorezmi."
He is referred to as a famous wrestler, national guardian, patriot and poet[7].
He is referred to as a famous wrestler, national guardian, patriot and poet. The people nicknamed him "Pakhlavon" and revered as "Pakhlavon Polvon", "Polvon ota", "Khazrati Polvon pir". It is known as the “piri” (Saint) of Khiva and its mausoleum as the anchor of the city. They say that the poet was buried in his house – in his workshop. Pakhlovon Makhmud was the organizer and spiritual mentor of the futuvat youth movement of the city's masters (XIII-XIV centuries). Many rubai are written on the principles of courage, blessing and mercy, generosity and nobility. In his works, the theoretical ideas of mysticism and the practical rules of the heroism are described in combination. According to him, the divine presence is reflected in all beings in the universe. Pakhlovon Makhmud thinks about the eternity of material existence, about man and nature, his companion and his taste. Rubai (quatrains) are distinguished by clarity of thought, depth of content, and a variety of images. Words such as "husband", "friend", "lover", "soul" have different meanings, and in Sufi poetry they mean "God" [9].

4-Picture. Pakhlovon Makhmud Puryorvariy

The interior of the Pakhlovon Makhmud mausoleum is decorated with incredibly beautiful patterns that amaze people. Each pattern, decorated with geometric floral and epigraphic ornaments, has a unique look, a common color for content. In the process of decorating patterns, it is taken into account that the master has a wonderful view from afar and close.



5,6-Pictures. Interior decoration of the mausoleum of Pakhlavon Makhmud.

The fact that the decorations in the interior are unified to a single color, that is, the color of the air, is given to people as a symbol of faith, luck, peace. In the decoration of the walls, compositions with patterns in an orange, routine frame are very skillfully used. It was found that each pattern is a coherent whole, using air color in the compositions. In decorations, especially in airy colors, intricate patterns could be worked out using tiny spiral patterns and many pattern elements. The dome represents the universe. This means that Pahlavon Makhmud spent his life exceptionally beautiful deeds and achieved the happiness of both worlds. The division of the dome into eight means the eight gates of paradise. The fact that the tip of the flower-shaped orange inside the dome is united into one point symbolizes the unity of Allah, the Creator of the universe. The patterns are decorated on a colored floor that represents the universe, that is, 18,000 universes. The decorative design in white is made in the image of spiritual purity. Although the contrast of colors made the patterns better at a distance, the latter philosophically implies that human life consists of acute strife and contradiction. Pahlavon Mahmoud says he has been fighting his whole life.

The composition of the symbolic pattern on the arch at the entrance to the tomb of Pakhlovon Makhmud attracts visitors. This esoteric symbolic design belongs to the type of zoomorphic design, and until now this composition has not been subjected to symbolic analysis by scientists. The composition is arched in the form of a rue, and for some reason our craftsmen used a flat pattern instead of a three-dimensional pattern in the form of a twisted marine rope. At the bottom of the arch of the mausoleum there is picture of a sailboat. Why did the craftsmen describe the ship? The top of the rudder is depicted in a rhythmic state with 16 chamomile petals in a large form, reminiscent of a pistachio flower. A ship in an arched decoration does not look good from afar, but a large hum from a distance adds interest to the architecture, repeating it in a rhythmic form in the form of an altar trimmed with thread from afar (Picture. 7)

At the bottom of the composition, water is depicted in the form of human shaped foam rings. If water personifies human life, that is, human life is depicted in the image of the past. Sand means adversity, a city built on sand. The Khiva anchor is depicted as Pakhlovon Makhmud. Why is the ship described? The ship is depicted in the image of Khiva. Because in its structure it is comparable to a ship. He is depicted standing on top of the earth. The fact that the ship is painted green means that the residents of Khiva and Pakhlovon Makhmud are faithful to Islam. The petals on both sides are given as a symbol of goodness and spiritual purity.

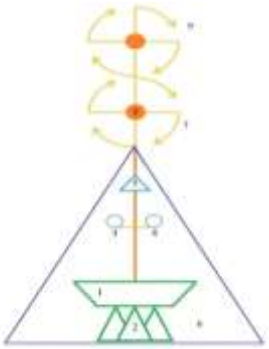
7-Picture. Composition of a symbolic pattern on the arch of the tomb of Pakhlovon Makhmud.

Aigul is described as a beautiful person. The triangle shaped three leafs that are used as crown, symbolize devotion to the family and loyalty to the Motherland. Bending on both sides leaf is described as symbol of life and food, as well as in the image of Pakhlavon Makhmud the person who lived on the path of goodness. A nightingale sitting on two pillars is a symbol of devotion, and Pahlavon Makhmud's symmetrical devotion to Allah and his homeland and it also symbolizes the unity of language and heart. Three leaves on the upper part of of the ship symbolize the greatness of God, the fact that Pahlavon Makhmud used such words such as "sweetheart", "friend", "soul" in different senses, in Sufi verses they are used as a "God" which describes Allah as a king of all being. On the top there is a 16-petal chamomile described in a rhythmic state. It can be seen that these daisies are rhythmically repeated sequentially and are connected to each other as a single chain. Thus, each daisy is compared to a galaxy that symbolizes the image of a system of galaxies, that is, 18,000 universes (metagalaxia). It is shown that each galaxy rotates around its axis like a spiral. The general color is given in the color of air that represents galaxy and world, on the other hand, it describes the image of peace. The green border on both sides of the Ruta pattern symbolizes the truth of the Islamic path. As a result of studying this ornament, the following scientific hypothesis can be made.

Ruta is a distribution pattern that is several times larger than the border pattern that connects two sides. Depending on the nature of the decorations, it can be connected in series, vice versa. In the architectural ornaments of Central Asia, rue patterns are often found in compositions with floral patterns. They are flower girih, in some cases, consist only of geometric patterns [10].

Results. An artistic analysis of the decoration of the Pakhlavon Makhmud madrasah has been developed and a model of a logical solution has been given. On a schematic basis, the main elements of the decor are symbolically depicted (Picture. 8). The arrangement of the pattern elements and their harmony are indicated in the model. The symbolic expression of Khiva. 2. Through the anchor, Pakhlavon Makhmud receives status, prestige, support and a great hero of Khiva. 3.4. The nightingale is depicted as a symbol of devotion. 5. He is given in the form of the greatness of Allah and His faithful servant. 6. It is indicated that Pahlavon Makhmud has reached a high status and rank in this mysterious world. 7.9. The endless movement of the chamomile

relative to the center is depicted as a circular movement, that is, the movement of galaxies.



8-Picture. The model of the logical solution of the decoration of the mausoleum of Pakhlavon Makhmud. 1. Kema. (ship) 2.Langar. (anchor) 3.4.Bulbullar (Nightingales). 5. Allah. 6.Triangle. 7.9 Chammies. 8. Water-weel (Charkhpalak).

Conclusion. In the composition of the rutasim pattern in the arch of the mausoleum of Pakhlavon Makhmud, it was discovered that Pakhlavon Makhmud was a symbol of his devotion and dedication to Allah, his homeland and his nation, and that he was the anchor of Khiva. It turned out that the distribution of large daisies in a single system describes the system of galaxies as a whole, 18,000 universes, that is, metagallaxia in the language of modern science.

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