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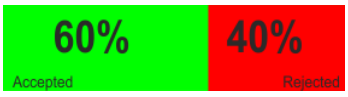

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Issue Article

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A NEW PERSON TRANSFORMING REALITY IN K.G. PAUSTOVSKY'S STORY «VALOR»

Abstract: *In this article, the author, based on the content and analysis of the story «Valor», examines the ideological and artistic, genre and style features of the work of K. G. Paustovsky.*

Key words: *epoch, landscape prose, talent, heroism, reality, ideological position, composition.*
Language: *Russian*
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НОВЫЙ ЧЕЛОВЕК, ПРЕОБРАЗУЮЩИЙ ДЕЙСТВИТЕЛЬНОСТЬ В РАССКАЗЕ К.Г.ПАУСТОВСКОГО «ДОБЛЕСТЬ»

Аннотация: *В данной статье автор на основе содержания и анализа рассказа «Доблесть» рассматривает идейно-художественные и жанрово-стилевые особенности творчества К.Г.Паустовского.*

Ключевые слова: *эпоха, пейзажная проза, талантливость, героизм, действительность, идейная позиция, композиция.*

Введение

В истории русской литературы К.Г.Паустовский связывает эпоху Тургенева, Чехова с литературой начала XX века, являясь блестящим представителем принципов и идей романтизма «сюжетных и стилистических образцов пейзажной и лирической прозы» [1, с.132].

Темы и идеи литературных произведений социально-исторически обусловлены. В великих литературных произведениях они строго соответствуют определившимся потребностям. «Постановка К.Г.Паустовским проблемы положения обычного трудящегося, его жизненных ценностей и приоритетов, проблемы пути достижения счастья и трагизма жизни всевозможных «страдающих эгоистов» отвечали коренным интересам трудового народа» [2,с.132; 3, с. 158]. Социально-историческая обстановка, особенности национального развития народа на определенных этапах его развития и обуславливают постановку тех или иных проблем в произведениях Паустовского.

В 30-е годы основное внимание в произведениях К.Г.Паустовского уделяется нравственным и эстетическим позициям человека. Вспомним рассказ «Доблесть», опубликованный в газете «Правда» в 1934 году. В нем говорится о коллективной борьбе за спасение жизни больного мальчика. Чтобы его спасти, необходимо было обеспечить в городе тишину. Люди сделали все, чтобы в городе было тихо: не сигналили автомобили и пароходы, в больнице была включена специальная установка – «экран тишины» [2, с. 133; 8, с. 197], заглушившая шум бури. Мальчик был спасен. В ответ на благодарственные слова матери выздоравливающего мальчика создатель «экрана тишины» [6, с. 476]. Изобретатель Эрнст, как бы от имени всех участников борьбы за жизнь ребенка, говорит: «Мы живем в великое время, и я так же велик, как и всякий трудящийся нашей

страны…, создавать счастье – это высокий труд. Его осуществляет вся страна. Благодарить меня не за что» [6, с. 477]. В этих словах суть рассказа. Автор как бы напоминает читателю, что высокая самоотверженность в работе на благо всех людей – нравственный долг каждого из нас. И мы должны постоянно беречь и воспитывать это человеческое качество и ценить его.

Соприкасаясь с трудом рабочих, инженеров, служащих, с их бытом и отдыхом, Паустовский глубже проникал в социальную основу талантливости и героизма людей. «Героизм – явление народное, - писал он в газете «Правда». – Народ создает героев так же, как создает замечательные легенды, сказки, песни. Он создает героев, любит их и преклоняется перед ними потому, что в героях справедливо видит образ будущего человека» [6, с.477].

В рассказе «Доблесть» Паустовский в роли отца в живой и увлекательной форме повествует об одном случае спасения человеческой жизни, сопровождая рассказ картинами портовой и морской природы, беглыми описаниями жизни людей того времени («Надо сказать, что от стародавних времен на морях еще сохранились заслуженные грузовые пароходы. Скрипя и тяжело переваливаясь на волнах, они проплывали около нарядных теплоходов и недружелюбно косились на них. Теплоходы шипели пеной и винтами и закатывались по ночам в морских горизонтах, как закатываются ослепительные планеты.») [6, с.474]. Глубина статического обобщения в рассказе сочетается со статичностью в изображении характеров. Ограниченный узкими сюжетными рамками рассказа, в пределах которых невозможно было показать героев в действии и взаимных столкновениях, раскрывающих наиболее полно их характеры, Паустовский прибегает к максимальному использованию других художественных средств. Именно жанровой спецификой «Доблести» объясняется преобладание в рассказе минималистичного портрета («Нарушений тишины не было, если не считать незначительного случая с портовым фонарщиком. Это был старый и веселый человек. Он шел и горланил песню, потому что приморский город привык петь и смеяться. Песни он выдумывал сам.») [6, с.475], мастерски построенного диалога («— Он будет жив, — сказала она и вдруг улыбнулась, глядя куда-то очень далеко, за спину Эрнста. Эрнст оглянулся. Позади никого не было.

— Вы великий человек, — сказала она. — Как я вам благодарна!

— Нет, — ответил, смешавшись, Эрнст. — Мы живем в великое время, и я так же велик, как и всякий трудящийся нашей страны. Не больше. Вы счастливы?

— Да!») [6, с.476], лаконичной и выразительной речевой характеристики героев, превосходных пейзажных зарисовок («Вечером в порт вошел английский пароход «Песнь Оссиана». Экипаж его, удивленный видом праздничного города, — город казался огненным каскадом, льющимся с гор в бесшумное море, — вежливо запросил начальника порта, что происходит. Начальник порта ответил ясно и коротко.») [6, с.477].

«Создание в литературном произведении какой-либо картины жизни требует от писателя такого построения произведения, которое помогало бы читателям представить себе эту картину жизни во всей ее полноте и цельности» [4, с.276]. К.Г.Паустовский так сгруппировывает показываемые им явления и характеры, так раскрывает связи и противоречия между ними, располагает события, что созданная им картина воспринимается в ее живом, сложном единстве, является отражением осознанных писателем закономерностей и фактов действительности.(« Маленький мальчик перестал рисовать цветными карандашами. Слезы высохли на его лице, и только ресницы были еще мокрые. Он засмеялся и спросил:

— А чей это был мальчик? Общий?

— Да, конечно, общий! — ответил я, застигнутый врасплох этим вопросом.») [6, с.477] . Паустовский в рассказе «Доблесть» показывает историю спасения одного мальчика, причем рассказывает автор данную историю своему сыну, который спросил у отца «Почему люди не придумали лекарства от смерти?» [6, с.474].

Рассказ К.Г.Паустовского «Доблесть» воспринимался критикой 30-х годов как стремление приукрасить действительность, его упрекали в сентиментальности. Однако в наше время он воспринимается как творческое свидетельство веры писателя в торжество гуманности и справедливости, веры в победу добра над жестокостью, чуткости над равнодушием.

«К октябрю 1937 года я думаю закончить новую книгу о будущем… Будущее – это прежде всего совершенно новый и высокий строй человеческих чувств и отношений. Черты будущего щедро рассеяны уже в нашей сегодняшней жизни… Напечатанные в «Правде» две мои новеллы «Доблесть» и «Музыка Верди» являются первоначальными набросками отдельных глав этой книги» [5, с. 163]. Именно в этот период, в начале 30-х годов, основной творческий поиск Паустовского направлен на проникновение в глубь новой жизни, познание устремлений и характеров людей того времени, преобразующих действительность. В этом и состояла и некоторая односторонность писателя, и вместе с тем выражался специфический перл его

творчества, который не утратил своей привлекательности доныне.

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Issue Article

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FORMATION OF INFORMATION AND DIDACTIC SKILLS OF FUTURE PHYSICS TEACHERS

Abstract: *The article examines the problem of the formation of information and didactic skills of future physics teachers. The importance of the development of information and didactic skills in the formation of professional competence of future teachers is conceptually substantiated. The methodological model of the formation of characteristics inherent in a competent student is being improved.*

Key words: *information and didactic skills, competencies, physical structures, educational process management, diagnostics, forecasting, training design, initial (external) level of motivation, basic (internal) level of motivation, higher (internal) level of motivation.*

Language: *English*

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Introduction

As a result of the theoretical analysis of scientific and pedagogical literature on the problem of the formation of information and didactic skills of future bachelors, as well as the results of the ascertaining experiment, it became necessary to develop a specific technology for the formation of information and didactic skills of students of future physics teachers based on a competence approach. The complexity of pedagogical systems poses to researchers precisely the task of formalization and, ultimately, modeling of the educational process. Thus, the link between pedagogical theory and practice is pedagogical modeling.

This research step is supported by the fact that, firstly, with the help of models, one can design a particular area of knowledge, skills, abilities of any participant in the pedagogical system, what they should be from the point of view of the desired result; secondly, based on the model, one can consider the phenomenon being studied as a system, verify the truth and completeness of theoretical concepts; thirdly, the comparison of what the system forms with what should be formed allows us to qualify the existing pedagogical system and carry out a conscious search for ways to improve it.

Modeling in didactics is successfully used to solve the following important tasks: optimizing the structure of educational material, improving the planning of the educational process, managing cognitive activity, managing the educational process, diagnostics, forecasting, designing training.

Main part.

In foreign literature, the "model" is understood by many authors as a representation of processes describing in a simplified form some aspects of the real world.

The general concept of the model is proposed by G.M. Kojaspirova and A.Y. Kojaspirov, who consider it as an artificially created object in the form of a scheme, physical structures, sign forms or formulas, which, being similar to the object under study (or phenomenon), displays and reproduces in a simpler and coarsened form the structure, properties, relationships and relationships between elements this object.

According to L.M. Friedman's interpretation, a model is a special object, a generalized and abstract representation, a scheme of the phenomenon being studied, or an original object.

Our task is to form students, future bachelors in physics, information and didactic skills based on a competency-based approach, which will be effectively improved in the process of further mastering the profession. It is appropriate to note here that the system-forming factor of our model (Fig. 2) is the result that the entire educational process is aimed at. This result is the informational and didactic skills underlying pedagogical activity, professional competence of the future physics teacher.

Any didactic process, regardless of the applied pedagogical technologies and the subjects studied, has a three-component structure: the motivational (target) stage, the stage of the learner's own cognitive activity and the stage of managing this activity. Let's look at the first one.

The concept of motivation in psychological and pedagogical sciences denotes a process as a result of which a certain activity acquires a certain personal meaning for an individual, creates the stability of his interest in it and turns the externally set goals of activity into the internal needs of the individual. Since motivation is, as it were, the internal driving force of the actions and actions of the individual, one of the necessary conditions for its active inclusion in educational work, teachers strive to manage it, including us when using electronic learning tools (ESO).

Motivation is a common name for processes, methods, and means of encouraging students to productive cognitive activity, active mastering of the content of education.

Since motivation is a multifaceted phenomenon, the content of training includes a whole range of means to maintain it. First of all, the means of maintaining motivation for cognitive, developmental and educational activities are important. In the general structure of motivation, the cognitive motive is dominant, which determines educational activity and attitude to it. It is based on a constant desire for personal self-improvement, for cognition and self-knowledge, as well as a connection with the content and organizational aspects of educational activities, i.e. passion for the process of cognition. In the process of educational activity, private motives begin to act related to the formulation, acceptance and solution of individual tasks to achieve specific learning goals, manifested in his desire to improve personal achievements [93, 198].

It is necessary to take into account that the motivational and value sphere of the individual (needs, attitudes, values) underlies any cognitive activity. This is explained by the fact that the student himself tries to determine the goals of his teaching, regulates this process and evaluates its success. At the same time, the needs transformed into motives contribute to the formation of motivation levels of professional development of the individual in the conditions of the university. There are three such levels in total.

The initial (external) level of motivation is associated with the fact that the need for professional development is motivated by an external social or narrowly personal motive (job responsibilities, career, etc.). It determines the external (formal) attitude to educational and cognitive activity.

The main (internal) level of motivation is achieved when the need of a specialist "finds" itself in a pedagogical subject, which is objectively necessary for further professional activity knowledge, skills, skills, professional positions and developed (adapted) psychological characteristics. Such an "objectified need" becomes an internal motive for the professional development of a specialist.

The highest (internal) level of motivation reflects the student's need for the development and productive realization of his creative potential. It is based on the high claims of a specialist for self-realization in educational and cognitive activity, which is accepted by him as the highest and main priority. The involvement of self-realization. At this level of motivation, achievement motivation plays a significant role. It is characterized by the desire of the student to perform the work at a high level of quality wherever there is an opportunity to show his personal skills and individual abilities.

It should be noted that the degree of awareness of the need to replenish their knowledge is not the same for different people. Students often come to the fore pragmatic motives associated with solving particular, situational problems. In these conditions, it is especially important to provide special measures for stimulating educational activities, maintaining positive motivation to study, and creating a favorable work regime when teaching using ESO. It is necessary to involve students in the independent activity of teaching, imitating practice, repeatedly strengthening the possibilities of analysis and synthesis of phenomena and processes.

We believe that computer-based learning tools are the means that create the necessary prerequisites for the emergence of internal motivation of a person's activity, especially when they are able to adapt to the trainees' characterological characteristics, their way of thinking, and the level of available knowledge. In this case, students begin to enjoy the learning process itself, regardless of external motivational factors.

The use of ESO in the educational process makes it possible to strengthen the motivation of teaching through the formation of a positive educational attitude. A computer can influence the motivation of students, revealing the practical significance of the material being studied, providing an opportunity to use the intellectual potential of students, show originality, ask any questions and offer any solutions to interesting problems, without the risk of getting a low score. All this creates a psychologically safe space

for creative search, forms such qualities of thinking as creativity, flexibility, etc., which, in turn, contributes to the creation of a positive attitude to learning.

As for entertainment as a source of motivation for learning, the possibilities of the computer here are truly inexhaustible, and the main task is to ensure that this entertainment does not become a prevailing factor in the use of the computer and does not obscure educational goals.

It is possible to maintain incentives for learning by creating a situation of success in learning. To do this, when using ESO, it is necessary to provide gradation of educational material taking into account the zone of proximal development for groups of students with different basic training, different skills in performing mental operations and intellectual development, i.e. it is necessary to have a data bank with tasks of varying degrees of complexity, providing for several methods and forms of submission of the same educational material, depending on the level basic knowledge, goals and development of trainees.

The effective use of ESO is possible if the following didactic conditions are met: the opportunity for each student to work on a computer and use various peripheral devices is provided; computer software has been developed that contributes to the formation of professional skills, in accordance with the identified didactic capabilities; the methodology of using ESO in the process of forming information and didactic skills is implemented, which ensures the inclusion of the student in the "advanced" professional activity, developed on the basis of didactic principles: scientific, systematic and consistent, clarity, accessibility, consciousness of learning, implementation of a differentiated approach and continuity in learning, unity of learning, education and development, as well as cooperation - co-creation in the process of formation of information and didactic skills; the readiness of the teacher to implement the developed methodology of using ESO in the process of forming information and didactic skills is ensured.

The use of ESO encourages students to master new forms of work on the application of acquired knowledge in project activities. The inclusion of ESO in the educational process makes it possible to actualize the system-forming function of motives, namely: it structures the content of perception, memory, thinking, i.e. all cognitive processes of students.

According to the American psychologist M. Ksikzentmihali, internal motivation arises only in cases when the "must" and "can" are balanced in the activity of the individual, when what needs to be done and what a person can do are brought into harmony. If in the perception of a person these two parameters of activity – requirements and abilities – correspond to each other, then the necessary conditions are created for internal motivation to arise in the activity.

Teaching with the use of ESO allows students to form a positive attitude to learning; to maintain their competence and self-confidence, thereby stimulating internal motivation; to increase the objectivity of self-esteem, discipline and intellectual activity, well-being and mood, and thereby the effectiveness of learning in general.

In our proposed model for the formation of information and didactic skills of future bachelors on the basis of a competence-based approach, we carry out in the course: "General Physics", in which the following blocks are highlighted:

In our model, we propose to use a classification three-level measuring scale to determine the level of readiness of students, where tests of the first two levels of assimilation according to V.P. Bespalko will be used.

1) low – those who have not reached the 1st level of assimilation;

2) average – those who have reached the 1st level of assimilation;

3) high – those who have reached the 2nd level of assimilation.

In the conditions of informatization of education, it is reasonable to monitor the educational process using computer testing to diagnose the level of readiness of students, since it is the most productive and progressive form of control today, which allows combining the content of measuring materials with high accuracy of evaluation of test results.

The essence of the concept of testing is closely related to the concept of "test". Tests are considered as "standardized tasks, the result of which allows you to measure the psychophysiological and personal characteristics, as well as the knowledge and skills of the subject."

The performance test is a set of specially selected tasks to identify students' knowledge and skills. The tasks included in the tests differ in that they require short and, as a rule, unambiguous answers.

Levels of formation of information and didactic skills in the use of electronic learning tools.

To determine the level of formation of information and didactic skills in the use of electronic learning tools, we have identified the following levels:

Low - a future teacher with this level of competence studies the available resources intended for use in his professional field of activity, and refers to them occasionally.

Average – a future teacher who has reached this level of competence uses ready-made resources in professional activities, is able to develop his own program and methodological materials.

High – a future teacher who has reached this level of skills has the knowledge and skills to organize the activities of teaching students to develop and use ESO in educational activities.

Thus, the training of physics teachers is a complex and lengthy process of formation of

professional culture, competencies, which determines the appropriate quality of education of schoolchildren in the future. The competencies of a future physics teacher are manifested when solving professional tasks in the process of obtaining education. Competencies are always manifested in activities. It is impossible to identify and diagnose unmanifested competence. Its nature is such that it can manifest itself exclusively in unity with human values, provided there is a deep personal interest in this type of activity.

Conclusion.

The implementation of the competence approach in education requires a fundamental change in the position of the teacher, the teacher, including physics. He ceases to be, together with the textbook, a carrier of "objective knowledge", which he seeks to convey to the student. Its main task is to motivate students to show initiative and independence, to organize independent activities of students, in which everyone (including the teacher himself) I could realize my abilities and interests.

As can be seen from the above in the monograph, among the many important components that make up the model of a specialist – teacher of physics in the context of the implementation of the competence approach, primary importance is attached to information and didactic skills - as tools that ensure the qualitative formation of professional competence.

First of all, we have considered the state of development of the competence approach in the theory and practice of vocational education, and also highlighted the main definitions of the concepts of "competence", "competence", "key competencies" and "professional competence". The competence approach involves deep systemic transformations in the educational process of the university, affecting teaching, content, assessment, educational technologies. The meaning-forming factor in the design of education is the development of the student's personality.

The analysis of modern psychological and pedagogical literature devoted to the work of a teacher allowed us to show that the concept of "professional competence" of a teacher unites all the diversity of professional skills of a teacher. However, professional competence is not just a set of professional knowledge and skills, but a complex individual psychological education based on the integration of socio–pedagogical experience, theoretical knowledge, practical skills and significant personal qualities, which determines the teacher's readiness to perform professional activities.

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Issue Article

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METHODOLOGICAL ASPECTS OF THE LAWS OF SYMMETRY AND CONSERVATION IN PHYSICS

Abstract: *This article methodologically substantiates the epistemological significance of the laws of symmetry and conservation in the physical cognition of the Universe. In the course of the development of physical science, the heuristic nature of the principle of symmetry and the fact that any physical law has a deep connection with the property of symmetry of the universe were revealed using scientific analysis.*

Key words: *symmetry, conservation, laws of symmetry, conservation laws, invariance, order, regularity, homogeneity of time, homogeneity of space, mirror symmetry, CP-invariance.*

Language: *English*

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Introduction.

For the human mind, symmetry seems to have a very special attractive force. We like to look at the manifestation of symmetry in nature, at the perfectly symmetrical spheres of planets or the Sun, at symmetrical crystals, snowflakes and other things that are almost symmetrical. "Symmetry is the idea through which man has been trying for centuries to comprehend and create order, beauty and perfection," said G. Weil [1.-p.7].

An analysis of the development of physics makes it possible to notice that the idea of symmetry led her along the difficult path to the ideal — a unified picture of the world. With the help of the idea of symmetry, a person tries to understand the order, beauty and perfection of nature. The original meaning of symmetry is proportionality, similarity, similarity, order, rhythm, coordination of parts in a holistic structure. Symmetry and structure are inextricably linked. If a certain system has a structure, then it necessarily has some symmetry. The idea of symmetry is also of exceptional importance as a leading principle in understanding the structure of physical knowledge. It is hardly possible to dispute the heuristic value and methodological significance of the principle of symmetry. It is known that when solving specific physical problems, this principle plays the role of a truth criterion.

Main part.

Since ancient times, the idea of symmetry has had a huge impact on the development of scientific thought. Natural philosophy, cosmology and mathematics were based on this idea even at its inception. The Pythagoreans created the first cosmological systems of a centrally symmetrical universe, they developed the teachings of proportions, musical tones and the five symmetrical polyphonies identified with the main natural elements. Hippasus coined the term "symmetry", which literally meant "proportionality". The ideas of symmetry, harmony and conservation were the main ones in the structure of ancient Greek thought and were understood as passing into each other. Anaximander, Anaximenes and Heraclitus created the doctrine of the eternal cosmos, which periodically arises and dies. The teaching of Leucippus and Democritus about emptiness and eternal and unchanging, but moving atoms is based on the idea of symmetry, harmony and conservation of matter.

The views of Pythagoras and his school were further developed in Plato's doctrine of cognition. Of particular interest are Plato's views on the structure of

the world, which, according to him, consists of regular polygons with perfect symmetry. Plato is characterized by the combination of the doctrine of ideas with the Pythagorean doctrine of number.

Later naturalists and philosophers who worked on the development of the category of symmetry are R. Descartes and G. Spencer.

R. Descartes wrote: "Whatever the inequality and disorder that, as we can assume, were established by God from the very beginning between the particles of matter, almost all of these particles must, according to the laws of nature, approach the average size and average motion." Thus, according to Descartes, God, having created asymmetric bodies, gave them a "natural" circular motion, as a result of which they were perfected into symmetrical bodies.

It is characteristic that science came to the most interesting results precisely when it established the facts of symmetry breaking. The consequences arising from the principle of symmetry were intensively developed by physicists in the last century and led to a number of important results. Such consequences of the laws of symmetry are primarily the conservation laws of classical physics.

During the Renaissance, the idea of symmetry, forgotten during the Middle Ages, was revived. Nikolai Kuzansky formulates the basics of the concept of homogeneous isotropic, infinite space. Leonardo da Vinci has an idea about the homogeneity of time. Arguments based on the idea of symmetry appear in the teachings of N. Copernicus. The Copernican system plays an important role in the perception of the idea of space-time symmetry necessary for the development of classical mechanics. J. Bruno defends the idea of an infinite homogeneous isotropic space. G. Galileo formulates the principles of inertia and relativity. He, as well as I. Kepler, R. Descartes and X. Huygens develop ideas about space-time symmetry to such an extent that they become fundamental in the “Principles” of I. Newton. The introduction of the concepts of absolute space and absolute time in Newtonian mechanics leads to the unification of local and cosmological symmetries into a single symmetry.

However, the invariant-theoretic approach, which originated at the beginning of the XVII century, could not be fully developed. Later, in the era of analytical mechanics, a style was established in which physical theory was formally considered as a mathematical theory of differential equations. L. Euler, J. Dalembert, J. Lagrange brought to the fore the axioms of dynamics. The dynamic approach did not need the idea of symmetry explicitly, but relied on it implicitly. And in the second half of the XVII century. the idea of symmetry temporarily lost its fundamental and heuristic significance. Conservation laws lost their main positions and became theorems — they were calculated as integrals of motion.

This style of thinking prevailed until the beginning of our century, when the invariant-theoretic approach was again brought to the fore. It became clear that the transition from the dynamic to the theoretical-invariant style of thinking became inevitable. Even in the middle of the XIX century. gradually increased interest in the principles of symmetry and conservation. This process was the result of two factors. On the one hand, physics was being freed from the tight confines of mechanics. New fields of physics were formed and rapidly developed - thermodynamics, optics, electrodynamics. J. Mayer discovered the law of conservation and transformation of energy. On the other hand, new mathematical theories developed - group theory, non-Euclidean geometry.

In classical physics of the XVII—XIX centuries, the idea of symmetry was not explicitly connected with the principles of relativity and invariance. As you know, in physics, the term “symmetry” comes from natural philosophy and geometry, and it was used primarily in crystallography, which, unlike mechanics, was not considered fundamental. The first to use the idea of symmetry outside the framework of crystal physics was P. Curie, who argued in 1894 about the symmetry of electric and magnetic fields. But Curie's idea remained undeveloped and had no impact on the development of physics. And only recently, after the works of E. Wigner, the principles of invariance and relativity as physical laws began to be understood explicitly as the principles of symmetry.

The invariant approach is formed and approved with the advent of the special theory of relativity. Within the framework of this approach, physical theories are considered as invariant theories of certain transformation groups. The further development of the idea of relativity - the creation of a general theory of relativity, the relativization of various physical theories, the experience of developing a unified field theory, the creation of relativistic cosmology (the works of A. Einstein, V. de Sitter, A.A. Friedman) - brought new successes in this direction in the first quarter of our century. Noether found out the connection between the principle of symmetry and the principle of conservation. The invariant approach was finally established in quantum theory as well. In 1930 P. Dirac wrote: “The theory of transformations, which was primarily used in the theory of relativity, and after that in quantum theory, expresses the essence of a new method in theoretical physics. Its modern progress consists in the fact that our equations are becoming invariant with respect to an increasingly wide class of transformations.” And truly, the successes of modern particle physics are unthinkable without the theory of invariants. The principle of symmetry permeates all the structures of modern physics. As a methodological principle, it underlies various physical theories and defines the structural organization of modern physical theory as a whole.

Analyzing in detail various specific types of symmetry, N.F. Ovchinnikov came to the conclusion that, in an abstract form, the principle of symmetry is a unity of opposites: change and preservation. “The unity of conservation and movement,” he writes, "is a brief formulation of symmetry expressed on an abstract-theoretical level." This definition of symmetry seems to be the most general and applicable for every case. Symmetry means that some transformations preserve some things, properties, and relationships. Conservation means identity, and transformations correspond to the changes that this identity is experiencing. In this sense, if conservation indicates an abstract, unchanging identity, then symmetry corresponds to a concrete, changing identity. In other words, symmetry is a concrete preservation. The path of cognition from the principle of conservation to the principle of symmetry is an ascent from the abstract to the concrete.

Both the principle of conservation and the principle of symmetry, according to N.F. Ovchinnikov, are “generalizing principles". This researcher formulated the law of symmetry conservation, according to which, with every violation of symmetry, a new, higher kind of symmetry is established. The discovery of some asymmetry does not mean the negation of the principle of symmetry. “Right” and “left” are themselves asymmetric, but taken together as a unity of opposites constitute the highest symmetry. In general, asymmetry is necessary as the opposite of symmetry. Asymmetry and symmetry in unity form the highest meta-symmetry.

Analyzing the effect of the principle of symmetry in various problematic situations, V.P. Vizgin notes two additional points: on the one hand, symmetry and its violations act as a source of a problematic situation and at the same time symmetry serves as a method of overcoming it, and on the other hand, a prioriization (“freezing”) of a certain type of symmetry prevents the resolution of a problematic situation. The first step to clarify the problem is the discovery of invariance, the establishment of symmetric elements. In the most general case, the desire to restore symmetry breaking is a way to overcome a problematic situation. Such heuristic power of the principle of symmetry as a method of finding a way out of a problematic situation is perceived as an actual justification of the law of symmetry conservation formulated by N.F. Ovchinnikov in the form of a universal principle of nature and scientific knowledge.

The effect of the principle of symmetry in problematic situations can be shown by some examples. When a theoretical understanding of experimental facts leads to the establishment of some symmetrical regularity, at the same time there is a need to rethink the theory so that it explains the symmetrical dependencies between these experimental facts.

The idea of symmetry has often served scientists as a guiding thread when considering the problems of the universe. Observing the chaotic scattering of stars in the night sky, we understand that the external chaos hides quite symmetrical spiral structures of galaxies, and in them – symmetrical structures of planetary systems.

The symmetry of the external shape of the crystal is a consequence of its internal symmetry – the ordered mutual arrangement of atoms (molecules) in space. It is the crystals that bring the charm of symmetry into the world of inanimate nature. Each snowflake is a small crystal of frozen water. The shape of snowflakes can be very diverse, but they all have symmetry – 6th order rotational symmetry and, in addition, mirror symmetry. Although there is a lot of complexity in physics, there is also a lot of simplicity and grace in it, which is largely due to the symmetry of physical laws and physical systems. Therefore, the concept of symmetry not only occupies an important place in physics, but also plays a powerful role in modern physical research. In order to investigate the physical consequences of the symmetry of the system, we obviously need to learn something about transformations and especially about the set (set) of transformations that leave some functions of the potential type unchanged.

The terms "symmetry" and "invariance" are often used synonymously, at least in the physical literature, where they denote "the property of remaining unchanged with respect to one or several different operations" [2.-pp.96-99]. Symmetry or invariance of objects always takes place with respect to certain, clearly fixed operations. The common thing between symmetry and invariance is that they are applicable to the same sets of changes, transformations of some parameters of phenomena. If the symmetry of a given group of transformations is included in the content of this law, then this law is necessarily invariant with respect to the same group of transformations. The invariance of the laws of nature is a consequence of those essential symmetries, which, however, are not fully included in their content. The difference between symmetry and invariance is that the invariance of laws, in addition to symmetry, expresses the degree of generality of these laws, i.e. the limits of their applicability.

The principles of symmetry and invariance according to the assessment of the famous American physicist E. The Wigners represent a kind of superprinciple, which relates to the laws of nature in the same way as the laws of nature relate to phenomena. The laws of nature allow us to anticipate one phenomenon based on what we know about other phenomena. The principles of invariance, says E. Wigner, should allow us to establish new correlations between phenomena on the basis of already established correlations between phenomena [3.-with 70]. By correlations, he means nothing more than

physical regularities, emphasizing that the laws of nature are just that regular, correct thing that exists in the behavior of an object. In quantum theory, this point of view is natural: the laws of quantum mechanics allow for an adequate formulation in terms of the correlation between successive observations of an object. These correlations according to Wigner are the patterns that are determined by the laws of quantum mechanics. The same can be said with respect to the theory of relativity.

It is known that the laws of phenomena operate under certain conditions. Indeed, each law expresses some kind of order, some kind of regularity in the spatial arrangement of phenomena and their following each other in time. For example, the laws of crystal structure express the order of arrangement of their elements: molecules, ions, atoms and their groups. The laws of chain reactions express the order of their states and stages following each other. Therefore, the main features of the laws are order, regularity in the phenomena of nature. Since this feature of laws refers to the symmetry of phenomena, the latter is very essential for understanding the laws of the phenomenon of the world. Without the category of symmetry, it is impossible to give a complete description of the category of the law, since each law includes a certain symmetry.

The principles of symmetry are beginning to play an increasingly prominent role in modern physics and often lead to certain conservation laws. The connection of conservation laws with the principles of symmetry is accepted by physicists as so fundamental that they classify the conservation laws of modern physics depending on the types of symmetry, and they identify the conservation principles themselves with the principle of symmetry in their physical contents and "do not distinguish between symmetry and conservation principles" [4. -c140]. Conservation laws are related to the existence of such transformations that are invariant (symmetric) with respect to transformations. These include:

1. The law of conservation of total energy, including rest mass, which is a consequence of symmetry with respect to time shift (time uniformity).

2. The law of conservation of total momentum, which is a consequence of symmetry with respect to parallel transport in space (uniformity of space).

3. The law of conservation of the total moment of the amount of motion, which is a consequence of symmetry with respect to rotations in space (isotropy of space).

4. The law of conservation of charge, which is a consequence of symmetry with respect to the replacement of complex parameters describing the system with their complex conjugate values (C-invariance).

5. The law of parity conservation, which is a consequence of symmetry with respect to the inversion operation (mirror symmetry, P-invariance).

6. The law of conservation of entropy, which is a consequence of symmetry with respect to the reversal of time (T-invariance).

7. The law of conservation of CPT-parity, which hides a combination of three symmetries (C-invariance, P-invariance, and T-invariance). CPT-parity is the product of three quantities – charge parity (C-parity), spatial parity (P-parity) and temporal parity (T-parity). Each of these evenness comes in as a conserved quantity corresponding to a corresponding specific discrete symmetry. Therefore, CPT-parity is an absolute conservation law.

In principle, it is impossible to deduce all sides of conservation laws from forms of symmetry, especially only from geometric ones. Conservation laws are related to symmetries not only geometric, but also dynamic. Not only certain types of symmetry and asymmetry can be compared with conservation laws, but also certain fields and their connections. Apparently, the manifestation of some types of interaction in others is a general pattern of the microcosm.

Conclusion.

The study of the interpenetration of various types of interaction will greatly contribute to the study of the interrelationships between conservation laws. For example, the conservation of leptons can be considered as analogous to the conservation of heavy particles (or baryons) in the case of light particles. The lepton charge is +1, and the lepton charge of their antiparticles is -1. According to this law, the total number of leptons before and after the interaction should be the same. Let's look at some more laws of preservation in the microcosm:

- Charge independence (often called isotopic spin conservation). This law is valid only for strong interactions. Due to the existence of electromagnetic interactions, the accuracy of the predictions obtained on the basis of this law lies in the redistribution of 1%. Charge independence predicts the identity of the forces acting between a neutron and a proton.

- Preservation of strangeness (associative birth of strange particles), symmetry of antiparticles, preservation of parity, these laws are valid for all strong and electromagnetic interactions, but are violated by weak interactions.

- The law of general symmetry of particles-antiparticles (CP-invariance) states that if any experiment is reflected in a mirror and all particles are replaced by corresponding antiparticles, then this new experiment will also be "legitimate". This law seems to be valid for all interactions.

Thus, conservation laws are associated with the presence of a certain symmetry, the role of group-theoretic understanding of them becomes clear, because group theory studies the most general consequences arising from the existence of a particular symmetry.

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Issue Article

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Karakalpak State University named after Berdakh
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INTERCULTURAL APPROACH IN TEACHING ENGLISH SOMATISMS TO STUDENTS OF PHILOLOGY IN KARAKALPAKSTAN

Abstract: *In this paper author focuses on an intercultural approach to teaching somatisms within the framework of a cross-cutting cultural theme. The author advises to expand and deepen this practice in relation to the problem of teaching idiomatic expressions of the English language, in particular somatic idiomatic expressions to philology students studying the Karakalpak language.*

Key words: *intercultural, competencies, dialogism, idiomatic expressions, linguoculturemes, educational center, somatisms.*

Language: *English*

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Introduction

The main priority of modern teaching, particularly the English language is mastering it at a full extent. Learners strive to acquire it being educated all language and social skills. However, any language can not be obtained without culture awareness. Therefore, the main goal of the educators is to choose teaching techniques and methods for organizing students' educational activities that are maximally focused on the personal development of each student. The most essential elements in training are authenticity, communication and interactivity, as well as the development of intercultural competence" [15, 20]. Apparently, culture is characterized by such a parameter as dialogism. This is especially true of linguistic culture, the specificity of which, strictly speaking, becomes obvious almost exclusively in the conditions of intercultural communication. In light of this, the concept of "dialogue of cultures", which was substantiated in the works of the Soviet philosopher V.S., becomes relevant. Bibler, who understood by it the communication of representatives of different national cultures in a single society [2]. In the process of teaching a foreign language, this term should be understood as the ability of students to realize their national-cultural identity and, through this awareness, to adequately perceive the culture of the language being studied.

In the article by A.V. Barmina presents an extremely capacious and meaningful definition of this phenomenon: "Dialogue of cultures is a process of interaction between different cultures, as a result of which each culture not only gets to know the other, but also becomes aware of itself.

This is a natural result of the development and deepening of cultural relationships. The most important element of dialogue is not so much the cultural information itself, but the ability to receive, record, preserve and transmit this information, as well as the ability and ability to establish a dialogue between different cultures (cultural forms, language systems, national traditions, religious systems) and ensure its stability" [1]. It is this "skill" that constitutes the key content of intercultural competence, and its inculcation, in our opinion, should be one of the priority goals of teaching a foreign language in general and teaching foreign language idiomatic expressions in particular.

The subject of intercultural dialogue usually contains values as preferences of a person or society, expressed in behavioral practice: "Value is the meaning of an object for a subject, it is a special type of meaning, it is a relationship, and not a property of

things, people or their activities. It is the value attitude towards the world that determines the specificity of culture as a phenomenon" [3]. Among other things, it follows from this that values as a phenomenon are of a purely social nature and, therefore, they are never absolute. This is proven by the fact that the system of values accepted in society not only varies across different regions and social strata, but also constantly changes dynamically over time, in accordance with changes in the cultural and historical living conditions of the ethnic group. Along with this, the idiom may contain some universal values, as well as "anti-values": "Thanks to the study of the semantics of Russian and French phraseological units, it has been established that many of them represent universal values, as well as individual universal anti-values associated with the fact that in society is unlawful, illegal" [5].

However, the idiom of a language, fixing certain values in itself, changes with much less dynamics, "lagging behind" the value system in time. Therefore, as a result, the "internal form" of the idiom as a kind of "frozen" linguistic unit becomes obscured not only from the point of view of representatives of other cultures, but even from the point of view of the native speakers themselves, since the values implicitly conveyed by them lose relevance over time or are subject to some rethinking. It is clear that this circumstance greatly aggravates the difficulties of students mastering foreign language idioms, requiring the teacher to provide targeted explanations of both a cultural and etymological nature. For example, in the article by N.K. Skoruk gives the etymology of a similar phraseological unit with "value" semantics: An arm and a leg: "An arm and a leg ("This will cost you an arm and a leg").

The phrase sounds firm: this is a sacrifice, this is painful, this is a very high price. Where does this idiom come from? Let's go back to the time of George Washington, when it was not possible to take photographs in order to paint portraits or make sculptures from them. A very interesting fact: if you look at the portraits of that time, you will notice that people are depicted with one hand behind their back or even with two: portraits of that time are filled not only with a minimum of characters, but also with a minimum of limbs. If customers of a portrait wanted the painting to cost less, then it "was worth either an arm or a leg": artists priced the painting cheaper if it did not depict limbs, since painting them required more effort and time" [8].

It is quite obvious that the use of this kind of etymological references is not only methodologically justified, but also extremely useful for the general development of students' personality, because helps broaden their horizons.

It is no coincidence, from the point of view of N.D. Galskova, an intercultural approach to teaching foreign languages has great personal development potential [3]. In particular, this is justified by the skills it is aimed at developing the ability to use a foreign language (in all its manifestations) in authentic situations of intercultural communication (the process of developing skills and the ability to explain and assimilate (at a certain level) someone else's way of life/behavior (cognitive processes) the ability to expand the individual picture of the world by introducing native speakers of the language being studied to the linguistic and conceptual pictures of the world and better understanding their native language and their culture (development processes)

Skills instilled within the framework of an intercultural approach to teaching foreign languages (according to the concept of N.D. Galskova)

To the skills indicated one can also add the fact that O.A. Leontovich called cognitive flexibility, i.e. some complex ability [5] readiness to perceive phenomena unfamiliar to the individual from previous experience refusal to try to squeeze new experience into the rigid framework of one's own ideas recognition of the right of representatives of another culture to perceive the world from other positions ability to overcome stereotypes Factors of cognitive flexibility formed during the application of an intercultural approach to teaching a foreign language. Against this background, it is important to emphasize that one of the important conditions for applying the intercultural approach should be "the protection of one's own culture and language as a condition for preserving national identity" [3]. However, we believe that all of the skills shown in What was called above idiomatic competence is undoubtedly in demand in the process of intercultural communication.

Today, there is a very impressive practice of applying an intercultural approach to teaching phraseology within the framework of a cross-cutting cultural theme (see, for example, [11]). However, we intend to expand and deepen this practice in relation to the problem of teaching idiomatic expressions of the English language to philology students studying in the Karakalpak language.

The concept of a cross-cutting cultural theme was developed and introduced into use by V.V. Vorobyov, along with the concepts of linguoculturological field, linguoculture and educational concentration. All these concepts were formulated and recommended by the author in relation to the problems of teaching Russian as a foreign language. The concept of a linguoculturological field should be distinguished from the traditional concept of an associative field for linguoculturology, used in the conceptual analysis of linguistic units (see [3]).

According to V.V. Vorobyova, "the linguoculturological field is a hierarchical system of units that have a common meaning and reflect the system of corresponding cultural concepts" [13]. The unit of the linguoculturological field is the

linguoculturemе. Its characterization by V.V. Vorobyova is as follows: "Linguoculturemе as a complex inter-level unit represents a dialectical unity of linguistic and extralinguistic (conceptual or subject) content. This is a unit that is more "deep" in its essence than the word: word (LSV): sign – meaning; linguoculture: sign - meaning - concept/subject" [13]. This means that a linguoculturemе is a word in form, but its content also includes a cultural meaning: "A linguoculturemе absorbs and accumulates both the actual linguistic representation ("form of thought") and the "extralinguistic" closely and inextricably linked with it. , cultural environment" (situation, reality) - a stable network of associations, the boundaries of which are unsteady and mobile. Therefore, the word-signal inevitably awakens in a person who knows the language a special cultural communication, not only the meaning as a hint [Potebnya], but also the entirety of the "cultural halo"" [13.]

From these definitions we conclude that the components of a phraseological unit are also nothing more than linguoculturemes, since, losing the status of a lexeme, they do not generally lose the cultural associations that they have in the language. Let's take the following example. In Russian idioms, House built on sand, Like at home, Feel at home, House is a full cup, Live as a full house, Fend off the house, Not all at home, Hospice house, Yellow house, Crazy house there is no lexeme "house", but there is a linguoculturemе of the same name, which forms around itself a linguoculturological field with the same name - "house". This allows idioms with the same component to be grouped into a learning focus, i.e. "self-sufficient classes of educational material, interconnected by content continuity, increase and complication of information, movement from basic information to peripheral information, and also correlated with the intellectual capabilities of students and learning conditions" [13]. In turn, the process of mastering idioms included in the training concentration will in practice be carried out as the internment of a cross-cutting linguocultural topic into the main subject of training sessions. We intend to implement this idea within the framework of the research we are undertaking, limiting the range of English idiomatic expressions to be studied to those that include linguoculturemes with somatic meaning, i.e. components like arm, leg, eye, nose, head, ear, hair, forehead, neck, shoulder, back, belly.

The appropriateness of this approach is confirmed by the opinion of a number of researchers, according to which "somatic idioms are the core of idiomatic speech" [Smith, URL] and "manifest in almost all spheres of human activity" [14]. We accept the term somatic idioms as a working one. It acts as a synonym for a number of similar terms, such as "somatism", "somatic phraseological unit", "phraseological unit with a somatic component". According to the definition of M.G. Sulimova: "Somatism, somatic phraseology or phraseology with a somatic component is understood as a type of idiom that refers to gestures, facial expressions and psychosomatics of the human body, the imagery of which goes back to typical universal and culturally conditioned reactions" [10]. The enormous importance of somatic idioms in the English language is also evidenced by the existence of a fairly large body of actual philological research on this issue - see the works of [Orlova, 2011], [Magomedova, 2015], [Pushkina, 2017], [Pishkova, 2017], [Likhachova, 2019] and many others. etc.

Taking into account the fact that somatic idioms are characterized by high frequency, we are convinced that turning to somatic idioms will allow us not only to optimize the selection of language educational material (to form educational concentrations), but also to pay enough attention to a detailed study of the linguocultural aspect of the taught idioms.

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Issue Article

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TECHNIQUES FOR DEVELOPING STUDENTS' CREATIVE THINKING IN RUSSIAN LANGUAGE CLASSES

Abstract: *This article offers a variety of techniques that contribute to the development of creative thinking of students in Russian language classes. The techniques are both traditional with elements of innovation, and new, the use of which has been tested for classes with students.*

Key words: *Development of creative abilities; education of overactive imagination; social, mental and physical progress; skills; creative thinking; creativity; creation of an emotional background; activation of search and creative activity; development of creative thinking; effective memorization of educational material; broadening the horizons of students.*

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ПРИЕМЫ РАЗВИТИЯ ТВОРЧЕСКОГО МЫШЛЕНИЯ СТУДЕНТОВ НА ЗАНЯТИЯХ ПО РУССКОМУ ЯЗЫКУ

Аннотация: *В данной статье предлагаются разнообразные приемы, способствующие развитию творческого мышления студентов на занятиях по русскому языку. Приведены приемы как традиционные с элементами новаторства, так и новые, применение которых апробировано на занятия со студентами.*

Ключевые слова: *Развитие творческих способностей; воспитание сверхактивного воображения; социальный, умственный и физический прогресс; навыки; творческое мышление; креативность; создание эмоционального фона; активизация поисковой и творческой деятельности; развитие творческого мышления; эффективное запоминание учебного материала; расширение кругозора обучающихся.*

Введение

Развитие творческих способностей у обучающихся предполагает воспитание сверхактивного воображения и работу над важными для их социального, умственного и физического прогресса навыками. Применение заданий, развивающих творческое мышление, играет важную роль в выявлении студентов, обладающих творческими способностями.

«Творческое мышление и креативность являются полезными и незаменимыми навыками современного человека» [7].

При обучении иностранным, в том числе и русскому, языкам возникает необходимость создания эмоционального фона заинтересованности, которая активизирует поисковую и творческую деятельность, а также помогает развивать творческое мышление, способствует эффективному запоминанию учебного материала, расширяет кругозор студентов.

В целях решения данной задачи предлагается на занятиях воспользоваться следующими приемами:

1. Задание: «Закончи предложения…»:

а)Жить –хорошо, а…
б) Чтоб умным стать…
в) От жадного друга…
г)Учись хорошему…
д) Любовь не …

2. Задание: закончите пословицу,изменив традиционную вторую часть.

а) Сытый голодного…
б) Век живи-…
в) Семь раз отмерь…
г) Двум смертям не бывать…
д) Работа не волк…
е) Смеется тот, кто …

3. Задание: составьте скороговорки: в каждой скороговорке должно быть 1-2 предложения с повторяющимися 1-2 труднопроизносимыми для студентов звуками (для нерусскоязычной аудитории можно подобрать отсутствующие в их родном языке звуки). Предложения могут рифмоваться.

Например: «Женя живет в Житомире. Жора живет в Женеве», «Дети идут в детсад. Тети едут в театр».

4. Задание: «Кто больше подберет к данному слову рифмующиеся слова из различных частей речи?» Запишите созвучные, но относящиеся к различным частям речи слова в столбик. Сочините стихотворение, в котором существует смысловое единство.

Например, к слову «дом»: дом-потом-слом-сом-том-бегом-втроем-войдем…

--------дом
--------втроем
--------войдем
--------потом.

5. Задание. Студентам предлагается подобрать трудно выговариваемые лично для них слова для чистоговорки. Чистоговорки-специальные речевые упражнения, состоящие из произнесения на одном выдохе трудно выговариваемых слов. Чистоговорки необходимы для отработки навыка произнесения звуков или их сочетаний.

Например: индустриализация, эксплуатация, субстантивация, прономенализация, синхрофазотрон, индивидуализация…

6. Задание: «Озвучьте фильм». Для выполнения задания можно взять видеоклип из социальных сетей, отрывок из кинофильмов, мультфильмов. Можно дать задание самим студентам подготовить видеоклип на различные жизненные ситуации. При выполнении задания студентам необходимо предварительно просмотреть видеофильм и, учитывая показанную ситуацию и эмоциональные состояния действующих лиц, озвучить высказывания героев.

7. Задание: составьте рассказ, используя данные глаголы. В рассказе должны быть экспрессивные(т.е. выражающие различные оттенки эмоций) оценки со стороны автора: портретных характеристик героев, описаний природы, речи и действий героев, происходящих событий. Желательно применять тропы.

Глаголы, которые можно предложить для выполнения задания:

«Пришел, увидел, победил» [4]

Пошли, встретили, испугались, смогли преодолеть, одержали победу.

Играла, увидела, не испугалась, спасла.

8. Задание: студенты должны передать основные моменты сюжета своего любимого романа, повести, рассказа, сказки в глаголах, учитывая лицо, число, род, время, но не называя героев. Студенты по очереди читают глаголы, а остальные ,на основе приведенных глаголов, должны правильно назвать произведение. . Например:

Жили-были, попросил, испекла,поставила, убежал, встретил, спел, убежал, встретил,спел,бежал, встретил,спел,убежал, встретил, спел,попросила спеть, прыгнул, спел, съела. (сказка «Колобок»)

9. Задание: Составьте по три предложения с глаголами в прошедшем, настоящем, будущем временах. Учитывая, что человек при составлении предложений пользуется словами, содержащими информацию о его внутреннем эмоционально-психологическом состоянии, которое непосредственно связано с его жизнью, с реализованными и нереализованными желаниями и мечтами, проанализируйте составленные предложения во временном плане.

Например: «Я хотела поступить в вуз». «Я любила ходить с подругами в парк». «Мои родители учились в медицинском институте».

Психологический анализ: девушка мечтала о высшем образовании. В ее семье гордились тем, что они люди интеллектуального труда. Раньше у девушки было активное общение и отдых с подругами, и ей это нравилось. Но в данный период на встречу с подругами ей, по-видимому, времени не хватает, и это ее, скорее всего, огорчает.

10. Задание: Составьте свое предложение, добавьте слово какую-либо одну частицу и пронаблюдайте, как изменится содержание предложения.

Например: Перед какими словами можно добавить частицу «НЕ» и «ТОЛЬКО»? Обратите внимание на то, как меняется смысл предложения в целом.

1) Мир всегда прекрасен для меня.
2) Он говорил ей, что любит ее.
3) Я хороший человек.
4) Он любит ее.

11. Задание: Напишите цитату из любимого фильма (мультфильма, литературно-художественного произведения).Остальные

студенты должны назвать фильм(произведение), из которого взята данная цитата.

Например: «Жить –хорошо, а хорошо жить – еще лучше!»(из кинофильма «Кавказская пленница»). «Ради высокой цели можно и жизнь отдать…чужую,конечно», «Либо природа подавит тебя, либо природа подавится тобой!» (из мультфильма «Мадагаскар»). «Ребята, давайте жить дружно!» (из мультфильма «Приключения кота Леопольда»)[1], «Кто ходит в гости по утрам, тот поступает мудро!»(из мультфильма «*Винни-Пух идет в гости*») [2].

12. Задание. До выполнения данного задания на занятиях по русскому языку необходимо просматривать мультфильмы, а в конце учебного года провести тестовые испытания в целях закрепления пройденных тем. «В каких мультфильмах встречаются эти крылатые фразы?» Даются тестовые задания. Например:

1. «Шеф, я вас наблюдаю!»

«Бременские музыканты»

«Утиные истории»

«Следствие ведут колобки»

2. «Пять ромашка, шесть ромашка, А я четвертую сорвал!»

«Трям! Здравствуйте!»

«Козленок, который считал до десяти»

«Земляничный дождик»

3. «Ребята, давайте жить дружно!»

«Ну, погоди!»

«Приключения кота Леопольда»

«Колобок»

4. «А мы тут, знаете ли, плюшками балуемся!»

«Малыш и Карлсон»

«Котенок по имени Гав»

«Буратино»

5. «До пятницы я совершенно свободен!»

«Дед Мороз и лето»

«Лягушка-путешественница»

«Винни-Пух идет в гости»

6. «А вы не были на Таити?»

«Мешок яблок»

«Ореховый прутик»

«Возвращение блудного попугая»

7. «Я на солнышке лежу, я на солнышко гляжу...»

«Как Львенок и Черепаха пели песню»

«Как Ежик и Медвежонок небо меняли»

«Пластилиновая ворона»

8. «Это я, почтальон Печкин, принес заметку про вашего мальчика!»

«Как Ежик шубку менял»

«Трое из Простоквашино»

«Бобик в гостях у Барбоса»

9. «Птица Говорун отличается умом и сообразительностью»

«Мадагаскар»

«Тайна третьей планеты»

«Трое из Простоквашино»

10. «Акелла промахнулся!»

«Ледниковый период»

«Маугли»

«Вини – Пух и все, все, все»

11. «Я — птица вольная! Куда хочу — туда лечу!»

«Дюймовочка»

«Домовенок Кузя»

«Большой секрет для маленькой компании»

12. «А в попугаях-то я гораздо длиннее!»

«Боцман и попугай»

«Чебурашка»

«38 попугаев»

13. «Где карта, Билли?»

«Остров сокровищ»

«Алиса в стране чудес»

«Пес в сапогах»

14. «Маловато будет! Ма-ло-ва-то!»

«Маугли»

«Падал прошлогодний снег»

«Маленький Мук»

15. «Какой такой павлин-мавлин? Не видишь, мы кушаем!»

«Приключения Буратино»

«Масленица»

«Приключения Мюнхгаузена»

16. «Подайте на домики для бездомных поросят!»

«Приключения поросенка Фунтика»

«Следствие ведут колобки»

«Тигриные полоски».

17. «Если мы не увидим рассвет, мы опоздаем на всю жизнь»

«Летучий корабль»

«Каникулы Бонифация»

«Паровозик из Ромашково»

18. «Они меня пытали, они ели мои блинчики!»

«Котенок по имени Гав»

«Утиные истории»

«Жил-был пёс»

19. «Не знаете, будет в этом году весна?»

«Снежная королева»

«Домовёнок Кузя»

«Падал прошлогодний снег»

20. «Щасс спою!»

«Ну, погоди!»

«Жил-был пёс»

«Бобик в гостях у Барбоса».[1]

13. Задание. Составьте свою полную версию рассказа, используя приведенные сверхкраткие сюжетные рассказы.

1) «О, закрой свои бледные ноги» (моностих Валерия Брюсова 1895 года)

2) «Последний человек на Земле сидел в комнате. В дверь постучались…» (Фредерик Браун) [5]

3) Я встретил родственную душу. А она – нет.

4) Продаю парашют: никогда не открывался, слегка запятнан.

5) Это наша золотая свадьба. Столик на одного.

6) Сегодня я снова представился своей матери.

7) Путешественник еще подавал сигналы. Земля - нет.

8) Я принес домой розы. Ключи не подошли.

9) Моя мама научила меня бриться.

10) На разбитом ветровом стекле было написано: «Молодожены».

11) Я спрыгнул. А затем передумал.

12) Мое отражение только что мне подмигнуло.

13) Он кормит из бутылочки убийцу своей жены.

14) «Извини, солдат, мы продаем ботинки парами».

15) «Хирург спасает пациента. Пациент благодарит Бога» [6].

14. Задание. Попытайтесь понять смысл данного теста. Перепишите текст правильно.

«Пиревт! По рзалульаттам илссеовадний одонго анлигйскго унвиертсиета, не иеемт занчнеия , в кокам пряокде рсапожолены бкувы в солве. Галвоне, чотбы преавя и пслоендияя бквуы блыи на мсете. Осатьлыне бкувы мгоут селдовтаь в плоонм бсепордяке, все- рвано ткест чтаитсея без порбелм. Пичрионй эгото ялвятеся то, что мы не чиатем кдаужю бкуву по отдльенотси, а все солво цликеом». [8]

15. Задание. Опираясь на ключевые слова, выраженные существительными в именительном падеже и касающиеся содержания литературно художественных текстов, назовите произведение и его автора. Задания такого типа можно использовать на занятиях, связанных с изучением творчества определенного писателя.

Например:

Назовите произведения Н.В.Гоголя, опираясь на ключевые слова .

1. Черт, кузнец, Оксана.(«Ночь перед Рождеством»)

2. Ружье,соседи-помещики,гусак.(«Повесть о том,как поссорились Иван Иванович с Иваном Никифоровичем»)

3. Грицко, полячка-утопленница, Ганна.(«Майская ночь, или утопленница»)

4.Казак-гонец,нечистая сила, грамота. («Пропавшая грамота»)

5.Чиновник,переписка собачек, сумасшедший дом. («Записки сумасшедшего»)

6.Девушка, отец, ярмарка, мачеха, влюбленный парубок. («Сорочинская ярмарка»).

16. Задание. Преподаватель находит небольшой текст на русском языке, состоящий из 5-6 предложений, и «разрывает» его на отдельные слова, смешивает порядок следования предложений и слов. Студентам предлагается составить текст из предложенных слов, с учетом их морфологических и синтаксических связей. В составленных студентами текстах не должны оставаться не использованные слова

Образцы текстов разной сложности :

1.Стояла зима. Был сильный мороз. В чистом голубом небе кружились пушистые снежинки. Они медленно падали на белоснежную землю.Такая чудесная погода очень радовала меня.

2. Закончилось прекрасное, жаркое лето. Наступила осень. Она покрыла листья деревьев лёгких бронзовым слоем. Когда прилетал прохладный ветер, он уносил эти листья, и они кружились вокруг него золотым хороводом. Птицы, которые не улетели на юг, тоже принимали участие в осеннем празднике. Осень для меня самое прекрасное время года ! [9]

3. Наступила осень. Часто идет дождь. Листья с деревьев опали. Лужи блестят по краям дороги. Только трава зеленеет по обочинам дорог. Птицы летят на юг.

4.Наступила осень. Ее разноцветный наряд очень красив. В далеких лесах выросли вкусные грибы. Скоро они появятся на столах всей России. Также нельзя не отметить урожай ягоды. В этом году он особенно хорош. [10]

На занятиях по русскому языку можно через применения творческих заданий создавать эмоциональный фон, формировать поисковую активность и логическое мышление, использовать и развивать личный творческий потенциал студентов. Творческие задания связывают изучение языка с фольклором, художественной литературой, а также с другими видами искусств (киноискусство, мультипликационные фильмы и т.д.) и науками (психология, культурология и др.), расширяют словарный запас обучающихся, развивают у студентов творческое мышление, воображение и монологическую речь.

«Чем жизнь более нестандартна, тем интереснее жить. От нас часто требуется креативный подход, способность мыслить нешаблонно делает нас остроумными, находчивыми, успешными, предприимчивыми, удачливыми и богатыми.умение быть креативным может пригодиться всегда и везде» [7].

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Issue Article

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THE USE OF MIND-EDUCATIONAL MAPS WHEN WORKING WITH TEXT BASED ON THE WORK "BLACK ARAB" BY M. PRISHVIN

***Abstract**: The article examines the nature of the genre, combining elements of fiction, science, journalism and philosophy, giving the author the opportunity to fully realize his unique talent as a lyricist, researcher and essay philosopher; the schemes of the work and their symbolism are examined; interaction of the human soul and nature, the reaction of man, namely his inner, spiritual world in response to certain manifestations of the external world.*

***Key words**: motivic spectrum, leitmotif of the work, pseudo-plot, mythical image, oriental flavor.*
***Language**: Russian*
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ИСПОЛЬЗОВАНИЕ ИНТЕЛЛЕКТ-ОБРАЗОВАТЕЛЬНЫХ КАРТ ПРИ РАБОТЕ С ТЕКСТОМ НА ОСНОВЕ ПРОИЗВЕДЕНИЯ «ЧЕРНЫЙ АРАБ» М.ПРИШВИНА

***Аннотация**: В статье рассматривается характер жанра, объединяющий элементы художественной литературы, науки, публицистики и философии, давая возможность автору максимально реализовать свой уникальный талант лирика, исследователя и философа-очерк, рассматриваются схемы произведения и их символика; взаимодействие человеческой души и природы, реакция человека, а именно его внутреннего, духовного мира в ответ на те или иные проявления внешнего мира.*

***Ключевые слова**: мотивный спектр, лейтмотив произведения, псевдосюжет, мифический образ, восточный колорит.*

Введение

Исходя из статьи И. А. Кальвина «Авторское сознание в поэме М. Пришвина «Черный араб»[1], рассматривается вопрос о взаимодействии реальной личности и образа автора в литературном произведении. Особенно актуально это проявляется в литературе автобиографического характера, где автор и герой максимально приближены друг другу, но во многих ситуациях они не идентичны. И именно такая проблема специфики жанра, а также соотношения героя и автора находит свое отражение, где образ автора раскрыт не традиционным путем.

В 1910 году путешествуя по Средней Азии вел дневник и на основе этих путевых записях создал два произведения с различными жанрами: «Адам и Ева» и поэтическую повесть «Черный араб»[2].

Самой характерной чертой этого очерка является то, что автор именно в нем достиг слияния природы и ее людей полностью так, что

[1] 3. М. Автор и герой в эстетической деятельности // М. Литературно-критические статьи. М.:Искусство, 1986.- 412 с

[2] Пришвин М. М. Черный Араб // Собр. соч.: В 8 т. – М.: Художественная литература, 1982. – Т. 1. – С. 500-532.

сам превратился в «черного араба». В данном случае обратим внимание на название повести: «черный араб» - человек, который принял обет молчания; где цветовая гамма «черный» -символ ухода от земных радостей, смерти, скорби, стресса, траура, неоднозначности, тайны и пугающей неизвестности («тайна покрытая мраком»). А в японской культуре чёрный — символ возраста и опыта по контрасту с белым цветом, который символизирует ученичество, молодость. В данном случае этот цвет обозначает таинственность повествователя.

Отметим также слово «араб»:

- представитель одного из семитских народов, издавна населявших Ближний Восток и Северную Африку. Название этого «синтезированного» народа год за годом, медленно, но неуклонно меняло свой смысл. Когда-то **арабом** называли просто аравийца: была страна, которая звалась Аравией. Однако сути проблемы такая связь не раскрыла. Существовал язык, который называли арабским, и именно он в данном случае является критерием оценки[3].

-Азербайджанцы, персы и арабы часто имеют круглое лицо, среднее и узкое по ширине, без выраженных скул; объемные губы; широкий и короткий выступающий нос с прямой спинкой; подбородок на широкой нижней челюсти вперед не выдается.

Обращает на себя внимание тот факт, что идет смежность по внешним параметрам писателя, т.е. Пришвин весьма очевидно мог быть похож на араба.

Повесть написана по содержаниям путевого дневника под названием «Киргизские степи». За этими путевыми набросками, содержащими личные ассоциации легко чувствуется автор, его мысли несут решение, реакцию на окружающих; как будто читатель едет вместе с ним и видит перевоплощение автора в «араба», который мчится от аула к аулу. Степь, по которой путешествует черный араб с одной стороны реальная, в которой живут кочевники, а с другой - волшебная.

По нашему мнению, цель рассказа поиск земли обетованной, и истинной правды. Автор в своём повествовании создает энергичный, сжатый и яркий рассказ о степных жителях и о звёздах разукрасивших ночное небо далёкой Киргизии. А мотивный спектр, может быть, представлен следующими мотивами:

– странствие;
– уход;
– принятие;
– поиск;
– распространение новости в степи.

Лейтмотив произведения выражен во фразе «Хабар бар!», посредством которого автор незримо объединяет отдельные части произведения в единую повествовательную ткань.

Если рассматривать произведение с точки зрения его формального оформления то повесть состоит из шести рассказов, каждая уникальна по-своему:

1. «Длинное ухо»
2. «Пегатый»
3. «Степной оборотень»
4. «Орел»
5. «Волк и овцы»
6. «Черный араб»

В произведении описывается многочисленные пейзажные зарисовки как географического, так и этнографического характера, это знакомит читателя с экзотическим миром Киргизской степи.

В ней легенды формируются из непосредственной повседневной жизни в сюжетах времени. Они перевоплащаются на глазах читателя, где путешествия по степи «Черного араба» – это миф о дальних предках, «вечных людях», странствующих по земле. Изложение в повести подвижно: реальность перетекает в мираж, а мираж подтверждается ситуациями в реальной жизни. Так встречающиеся в степи излагали легенду как собственную судьбу: ... *«Ночью дочь этого старика хотела поправить мальчика в люльке, схватилась, а там его нет, бросилась из юрты, а - на пегатом коне мчится с мальчиком в степь араб. Будто в это время верблюдица хватилась верблюжонка и не помня себя понеслась за ней женщина с сыновьями. Так и остался старик лет один пасти баранов…»*

В этом своеобразном мире, где мираж и реальность не различимы происходит создание легенды. Герой, создавая легенду об арабе придает рассказу таинственность: араб в Киргизской степи – это явление необычное, да еще и черный, да к тому же молчит; возникает ассоциация что он паломник, киргизы – мусульмане уважают волю араба, избегающего общения. Но тут же легенда отрицает материальный прообраз: *«…Нет подумали здесь нет уже Черного Араба; здесь у костра сидит обыкновенный киргиз, его все знают, он как все. А тот все едет до настоящей пустыни, теперь тот настоящий араб, а не этот»*. Это легендарный миф интересует людей в большей степени, чем житейская проза.

Легенда незримо пронизывает весь текст произведения:

[3] Томас Эдвард Лоуренс, «Семь столпов мудрости» / перевод с англ. Г Карпинского, 2015 г. (цитата из Библиотеки Максима Мошкова)

«…*Исаак все рассказывал старику об Арабе, уверяя его, что мальчика унесла желтоволосая бесплодная женщина не араб, а верблюжонка - волк*». Старик будто поверил словам Исаака и сказал: *« Раньше бесплодные женщины ходили ночевать с молоком в святые горы Алатау, а вот теперь стали красть мальчиков у бедных людей .....»* и читатель убеждается в том, что «Черный араб» едущий из Мекки, вошел в народную копилку киргизских легенд.

В данном произведении нет связи миниатюр предыдущего с последующим, как такая цепь обнаруживается в микропрозе «Фацелия», однако все эти 6 частей показаны и описаны отдельной историей, с теми же героями; и весть (хабар) передается до конца последнего рассказа по «длинному уху».

Для более полной характеристики рассматриваемого вопроса в последующем были проанализированы рассказы, входящие в повесть «Черный араб». Рассмотрим каждый из них по отдельности:

«Длинное ухо»

Начнем с объяснения самих названий рассказов, так как «поэтика заглавий» - ключ познанию текста.

«Ухо» – это символ новости, а «длинное» - символика степи, уподобление степи, где степь длинная, широкая а новости (хабар) передается по этой степи в каждый дом.

Длинное ухо, новости которые передаются в степи из уст в уста.

«..Сама родится новость в степи или прибежит из других стран – все равно: она, крылатая, мчится от всадника к всаднику, от аула к аулу…»[4]

Лишь у границы степи новость сохнет, как ковыль без воды. Новость "хабар" это сообщение о новом или о том что недавно произошло.

Поэтика черного араба основана на конкретном описании. Конкретное звездное небо и желтая степь, контрастная жестокость киргизов и их добродушие, отвечающие человеку своим вниманием.

«Пегатый»

Пегатый – конь араба, пегий имеющий пятна другого цвета; разношерстный (о животном, обычно о лошади). имеющий неоднородную окраску.

Основная тема рассказа природа и человек, но объектом остается исследования человека. Взаимодействие человеческой души и природы, реакция человека, а именно его внутреннего, духовного мира в ответ на те или иные проявления внешнего мира. Описание картины окружающей среды нарисованы доходчиво и просто:

… *«– Чолпан! – сказал Исак Пастушеская звезда восходит, когда стада возвращаются с поля, и меркнет, когда стада уходят утром кормиться. Самая хорошая наша звезда…»*

В данном случае автор повествует о звездном небе Востока, где даже звезду называют простыми словами, исходя из своих ассоциаций. Звезда, будто указывает путь стадам и является их хранительницей.

Описывается особенность национальной картины мира: «…*Что я могу сказать Исаку о Полярной звезде? Да, она неподвижная.*

– И по-нашему она неподвижная.

– И у нас и у вас одинаково! – удивляюсь я…»

Это там, на простой земле, он пегатый и с лысинкой,– поправляют старые мудрые кони,– а здесь его имя пусть будет отныне и до века – гнедо-пегий конь с белой звездочкой…».

Сравнение коня араба с лошадьми кочевников, где пегатый с белой лысинкой – отождествляет намерения автора в степи.

В этом своеобразном двоемирии, где почти неразличимы мираж и реальность, легенда и быль, происходит создание легенды: *"Добрые люди мне посоветовали на время пути назваться арабом, будто бы я еду из Мекки, а куда – неизвестно. «Так, говорили, скорее доедешь: и сунулся бы кто поболтать, – нет: араб ничего не понимает ни по-русски, ни по-киргизски". Я пустил этот слух, и вот побежало по Длинному уху: "На пегатом коньке с лысинкой едет Чёрный араб из Мекки и молчит»*[5]- цель особенности восприятия мира с точки зрения национального взгляда.

«Степной оборотень»

Степной оборотень – это символ исповеди автора, однако слух останется о нем в виде оборотня, что все будут вспоминать в степи.

Автор в этом рассказе пишет о встрече с интересными людьми, описывает красоту природы и животного мира, а также не забывает о традициях и обычаях киргизского народа:

«…*Рамазан, девятый месяц лунного года, был на исходе. В ясное утро показались степные горы, как высокие синие палатки великанов-кочевников. Степь взволновалась, дорога стала неровной; ведро с водой, привязанное нами к дрожине, расплескалось и зазвенело…*[6]

В данном случае идет отсылка на религиозную тематику, где Рамазан-Священный месяц поста мусульман подходит к концу, по лунному календарю он является 9 месяцем. Автор сравнивает горы Киргизии с палатками великанов,

[4] Пришвин М. М. Черный Араб // Собр. соч.: В 8 т. – М.: Художественная литература, 1982. – Т. 1. – С. 500-532.

[5] Пришвин М. М. Черный Араб // Собр. соч.: В 8 т. – М.: Художественная литература, 1982. – Т. 1. – С. 500-532

[6] Пришвин М. М. Черный Араб // Собр. соч.: В 8 т. – М.: Художественная литература, 1982. – Т. 1. – С. 500-532

далее степь, словно оживилась и стала взволнованной что даже вода расплескалась. Целью такого сравнения является то, что даже природа не хочет прощаться со Священным месяцем, в котором прощаются все грехи.

«…Наверху круг еще синего неба; внизу на земле три черных, обожженных камня с рогулькой – очаг. За очагом, против входной двери, обращенной к Каабе, устлано ковром место для гостя, а тут же, рядом с ковром, растет ковыль. Кругом все увешано…»

Наряду с этим необходимо отметить, что автор подробно описывает дом кочевников, где все устлано коврами и отделено место для гостя, далее писатель подчеркивает как на Востоке уважают гостя, особенно, совершившего паломничество – это и есть культура, традиции Востока. Однако писатель не выдержал и признался им.

«Вот он сам седой, старый подаст гостю воду, чтобы помыть руки…» - по традиции это уважение к дорогому и почитаемому человеку. В юрте много гостей и все ждут…«Едет из Мекки, но куда неизвестно... Наконец, все поняли…Но еще больше ошеломил ответ гостя: «Я не араб. Джок не понятно. Но все закончилось просто..»[7]

«Волки и овцы»

Дневники М. Пришвина можно читать как лирическую книгу в прозе, возникшую на основе дневниковых наблюдений. Эти наблюдения кратко и красочно описывают быт и обычаи киргизского народа. Особенности встречи гостей и их гостеприимства: *"целая гора мяса лежала на блюде"*.

«…После обильного ужина все легли отдыхать, а утром, проснувшись, слушали рассказ охотника, который продолжал свою историю о том, что ночью волки украли трех ягнят. И он отомстил волкам и убил, а с седьмого раненого ободрал шкуру и отпустил; черный ободранный волк бежал еще версты три по степи. Собравшие одобряли и удивлялись силе охотника, и хохотали. Весело, представляя ободранного волка бегущего по степи…»

Так в коротком рассказе описано духовное богатство, обычаи степного народа точность в изображении народного быта.

«Орел»

В рассказе "Орел" М.М. Пришвин описывает ещё одну охоту любопытная по содержанию и дальнейшую дрессировку орла. Это жанр, где ярко описывается слияние природы и животных.

Подробное отображение охоты на орла и дальнейшее его обучение, делает автора участником, описывающим подробно все обучения орла к человеку.

Но интереснее и поучительно заключение: *«…И этот полувысохший кусочек мяса имеет какую ту силу над орлом, который тут же забывает и горы свои, семью, и только что добытую им самим еще тёплую богатую добычу, он все это забывает и летит к седлу Мамирбека, который надевает корону на глаза, а обещанный магический кусочек мяса прячет за голенищу и спокойно берет зайца пойманного орлом…Так приучают орлов…»*[8]

Читателю становится жаль орла, **"но это способ жизни охотника",** где обманным путем охотник берет свою добычу, а птица снова садится в ту клетку.

«Черный араб»

В "Чёрном арабе" легенда формируется не из предания, не из другой легенды, а непосредственно в повседневной жизни, в сюжетном времени.

В качестве дальнейшего анализа мы обратились к статье Охотниковой Г. П.: «Функция легенд в повести Пришвина «Черный араб».[9]

Погружённость кочевников в мир таинственных образов обусловлена самой природой: миражи сопровождают людей в степи, они сопоставляются в повести с кривым зеркалом. Таким же степным миражом является и псевдофакт – Чёрный араб. Автор ироничен: вся тайна исчерпывается тем, что Чёрный араб оказывается обыкновенным "киргизом", а легенда об арабе начинает самостоятельную жизнь.

Легенда формируется на наших глазах, во времени повествователя. Путешествие по степи Чёрного араба – это событие, инсценирующее обычаи мифической эпохи, это художественная эманация мифа о дальних предках, "вечных людях", странствующих по земле. Герой созерцает древний уклад и нравы и ощущает гармоническое единение с мифом.

Миражи как сюжетообразующий мотив лишают реальность конкретности, явственно обозначается двоемирие, в котором граница между мирами подвижна, и мы, читатели, не совсем уверены, где мираж, а где реальность. Это касается историй с украденными у женщины мальчиком, у верблюдицы – верблюжонком, об утрате стариком семьи. Таким образом, легенды степи так же фантастичны, как миражи, хотя и оперируют конкретными реалиями и типичными для данных обстоятельств ситуациями. Кони здесь обмениваются новостями и есть должность содержателя солёного озера.

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[7] Пришвин М. М. Черный Араб // Собр. соч.: В 8 т. – М.: Художественная литература, 1982. – Т. 1. – С. 500-532.

[8] Пришвин М. М. Черный Араб // Собр. соч.: В 8 т. – М.: Художественная литература, 1982. – Т. 1. Там же.

[9] Пришвин М. М. Чёрный араб // Пришвин М. М. Избранные произведения: В 2 т. М., 1972. http://prishvin.lit-info.ru/prishvin/kritika/ohotnikova-funkciya-legendy.htm

Поэтический мир повести подвижен: реальность перетекает в мираж, мираж подтверждается аналогичными ситуациями в реальной действительности. Так, старик, встреченный в степи, излагает легенду, слышанную героем, как свою собственную судьбу: «*Ночью будто бы дочь этого старика хотела поправить мальчика в люльке, хватилась – нет мальчика; бросилась вон из юрты, а там на пегатом коне мчится с мальчиком в степь араб. Будто бы около этого же времени верблюдица хватилась верблюжонка, заревела и, не помня себя, унеслась. За ней ускакали женщина и сыновья. Так и остался хозяин аула на старости лет один пасти баранов*»[10]

Степь – это тихое место, где формируются легенды, идеальное пространство для тайн, бесконечность, где возможно все.

У читателя возникает сомнение в достоверности истории, т. к. ему уже знакомы легенды, бродящие по степи, и о женщине, потерявшей мальчика, и о верблюдице, утратившей верблюжонка, но где пропавшие? Почему не возвращаются и никому не встречаются и ничего о них неизвестно? Они стали персонажами легендарного, мифического времени.

Тут же, на наших глазах повторяются, варьируются и воплощаются упомянутые сюжеты легенд во времени реальном: *«Девушка-невеста пела, пела над спящими стадами и уснула, а волки выходили из горных трещин в долину… Крались к самым кустам чиевника возле самых юрт, подбирались и прыгали … и сквозь лай, и гомон, и горловые крики был слышен тихий жалобный стон уносимого волками ягнёнка... Не сон – этот затихающий крик». А «в долине Потерянный топор украли просватанную девушку Нур-Джемеля. Жених потребовал возвращения калыма. Хозяин отказал. Жених сам угнал лошадей у отца невесты и теперь на берегу ручья сидит и ест одну из отбитых лошадей".*[11]На вопрос, кто украл, ответ один – «степь велика!».

Герой, создавая легенду об арабе, добавляет подробности, придающие рассказу оттенок таинственности: араб в киргизской степи – это явление уже необычное, а он ещё превращён в Чёрного, да к тому же молчит. И поскольку едет он из Мекки, то естественна ассоциация, что он паломник, возвращающийся из священного для всех мусульман места. Обитатели степи, киргизы-магометане, уважают волю араба, избегающего общения. Вместе с тем в степи продолжают жить языческие предания, весь мир населён духами, звёзды в небе – это воплощенные кони, волки, собаки, туда же переселились герои легенд, люди уравниваются с животными, а пустыня обладает памятью. Использование метаморфозы как приёма сближает поэтику "Чёрного араба" с поэтикой древнего эпоса.

Когда обнаруживается, что герой не араб, мысль, что он обыкновенный человек, приходит людям в последнюю очередь, в первую очередь им приходит на ум, не дух ли предков перед ними. Не случайна ирония писателя, когда он касается веры киргизов в единого бога – Аллаха: «*Солнце будто бы стыдится вечером, думают киргизы-магометане: оно краснеет, потому что когда-то его считали за бога. Исак молится не солнцу, как хочется думать, а невидимой отсюда Каабе».*[12]И в этом эпизоде мы наблюдаем бытование легенды, фиксирующей переход кочевников от язычества к единобожию.

Интересной является субъектно-объектная организация сюжета: и герой, и читатель знают о мистификации, о своеобразном карнавале, о розыгрыше, но этот момент псевдосюжета, в свою очередь, вызывает интерес – каким образом будет развиваться такая сюжетная ситуация, чем она может разрешиться?

Разрешается она удивительным образом: когда раскрыта тайна Чёрного араба, сомнение вызывает в первую очередь то, что у легенды есть материальная основа – живой герой. И легенда, отрицая свой материальный прообраз, начинает жить независимой, самостоятельной жизнью, входя как законная частичка в общенародную копилку опыта: "*Нет, – подумали мы, – здесь уже нет Чёрного араба. Здесь у костра сидит обыкновенный киргиз в широком халате и зелёном малахае, его теперь все знают, он – как все. А тот всё едет до настоящей пустыни, до низких звёзд, где только дикие кони перебегают от оазиса к оазису. Теперь тот настоящий араб, а не этот".*[13]

Легенда, таким образом, предстаёт в произведении Пришвина как результат коллективного современного творчества, она порождает новую художественную реальность, а человек, как всегда у Пришвина, показан в роли творца и преобразователя мира. Этот легендарный мир интересует людей в большей степени, чем житейская проза, поэтому творческий процесс, пополняющий новыми сюжетами мир преданий, бесконечен и жизнь является его почвой.

Сама степь тоже порождает легенды, она обладает памятью и соучастием как живое

[10] Пришвин М. М. Черный Араб // Собр. соч.: В 8 т. – М.: Художественная литература, 1982. – Т. 1. – С. 500-532.
[11] Пришвин М. М. Черный Араб // Собр. соч.: В 8 т. – М.: Художественная литература, 1982. – Т. 1. – С. 500-532.
[12] Пришвин М. М. Черный Араб // Собр. соч.: В 8 т. – М.: Художественная литература, 1982. – Т. 1. – С. 500-532.
[13] Пришвин М. М. Черный Араб // Собр. соч.: В 8 т. – М.: Художественная литература, 1982. – Т. 1. – С. 500-532.

существо. Так, например, горе собаки, потерявшей хозяина, нарушая гармонию мироздания, входит в память природы; опыт человека тоже останется в предании: "Свет и тишина … Собака бежит покорная. Но вой остался в пустыне, и раздвоенный взгляд остался. Длинное ухо услыхало вой, и миражи заметили, как смотрела собака, потерявшая хозяина"[14].

Степь, пустыня, усеянная костями и черепами, есть олицетворение истории, а человек, едущий по ней, участвует в этой истории и осваивает её со всеми вместе. Активность героя в этой ситуации проявляется, на первый взгляд, странно – он хочет быть причиной миражей, как бесплодная желтоволосая женщина, будто бы укравшая мальчика. Мысли о мираже созвучны перевоплощению рассказчика и дают повод для него: "И вот я – степной джигит". Само превращение происходит согласно архаическому принципу соответствия внутреннего – внешнему, костюма – социальной и национальной роли. Герой уверен, что даже лысинка на лбу у Пегатого гораздо важней для эпического человека, чем внутренний мир: «*Теперь, через десять лет, через двадцать, если они приедут на это место, называемое Сломанное колесо, то вспомнят араба со всеми подробностями: что малахай у него был зелёный и бешмет серый, а халат подпоясан красным кушаком, и на лбу у Пегатого была лысинка»*[15].

Соизмерение "высокого", небесного и человеческого актуально для повести: "И небо, всё это небо, с его большими пустынными низкими звёздами, исчезло от маленького земного, но близкого нам пламени" (3, т. 1, с. 176). Это объясняет приоритет незатейливых легенд, рождённых в степи, перед древними мифами, которые остаются на периферии повествования (земля Ханаанская с Авраамом, Ревеккой; мотив Мекки, Каабы, Аллаха и пр.).

Можно сказать, что всё когда-то уже случалось, происходило в этой степи, поэтому и становятся с лёгкостью легендой современные происшествия, ложащиеся на этот вековой ковёр преданий.

В конце повести вновь наблюдаем противопоставление земли Ханаанской и "настоящей пустыни", где «*Ревекка не выходит с кувшином из белых шатров напоить" верблюдов, но люди тем не менее верят, что "за этой пустыней текут семь медовых рек; там не бывает зимы; там будет вечно жить Чёрный араб»*[16]. И читатель убеждается в том, что Чёрный араб, едущий из Мекки, вошёл в народную копилку легендарных сюжетов.

Для преподавания методики русской литературы в иноязычной аудитории, необходимо выбрать методику, которая наиболее эффективно поможет студентам понять произведение.

В данном очерке нужно рассмотреть общефилологический метод «исследования» и «комментирования». Это необходимо для того, чтобы иностранная аудитория могла почувствовать национальный колорит Востока через произведение писателей русской литературы.

Что нам даст метод «исследования»? Данный путь поможет читателю (не носителю языка) через определенные слова схематизировать некую карту, а именно путешествие араба. В главе 1 теоретического аспекта нами было рассмотрено креативные технологии преподавания русской литературы в иноязычных аудиториях, где карта «образовательных путешествий», созданных при помощи заглавий поможет более раскрыть символы и образы произведения, а также выписывания и анализ отдельных конкретных концептов восточной культуры даст понять и раскрыть образы героев.

Уместно обратить внимание на комментированное чтение, предлагаемый Ж.Крыловым, где при помощи 2 слов на которых построен весь очерк, дает раскрыть наименования каждого рассказа. А именно, этими двумя понятиями начинается и заканчивается весь очерк.

«… - Хабар бар?

…-Бар!Бар!...»

Новость родится в степи, пробегая по длинному уху, разнесется пегатым конем, обернется степным оборотнем, представит в виде волка и останется как мираж…однако слух о «Черном арабе» останется в далеких странах Востока.

Интеллект-образовательные карты-путешествия:

В первой карте мы рассматриваем образ араба, исходя из описаний остальных героев.

[14] Там же

[15] Пришвин М. М. Черный Араб // Собр. соч.: В 8 т. – М.: Художественная литература, 1982. – Т. 1. – С. 500-532.

[16] Пришвин М. М. Черный Араб // Собр. соч.: В 8 т. – М.: Художественная литература, 1982. – Т. 1. – С. 500-532.

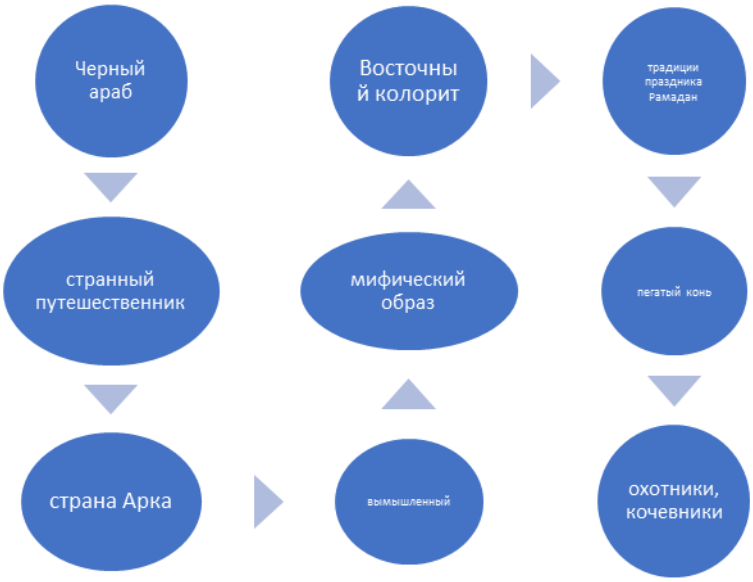

Рисунок 1.

Таким образом, рассказ "Чёрный араб" Пришвина является примером использования ярких образов, символики и приёмов повествования для передачи главной идеи о сопричастности человека к природе. Это делает его ценным материалом для изучения природной тематики в литературе и позволяет использовать различные методики преподавания для объяснения и анализа данного произведения.

В этой схеме рассмотрена «новость», которая мчится от аула к аулу

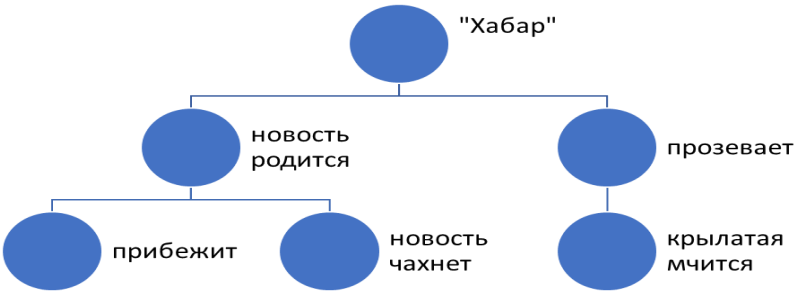

Рисунок 2.

Дальнейший анализ рассказа "Черный араб" Пришвина может включать исследование использования автором лексических и стилистических средств, таких как метафоры, эпитеты, повторы и другие, а также их роли в создании образа главного героя и передаче основных идей произведения.

Будет верным также рассмотреть схематизацию некоторых сравнений, которых автор описал в произведении:

Сухое «желтое море» жаждет пресной воды, но озера обманчивы, иллюзорны, они блестят как настоящие, но это только мираж. Вот оно, почти рядом, и блестит как настоящее, но – «вдруг будто сдунуло, ни озера, ни птицы, ни верблюда – все будто рукой сняло».

«Лошади отдохнут, всадники поболтают, понюхают табаку и разъедутся. Миражи, как в кривом зеркале, отразят везде их встречу».

Автор сравнивает мираж с кривым зеркалом, что в степи всегда отражает и везде отражает все, кто был там.

«Всю долину будто рассекли длинным скрученным канатом – так крикнули в ауле. Но и сквозь лай, и гомон, и горловые крики был слышен тихий жалобный стон уносимого волками ягнёнка и всё дальше и дальше, тише и тише». «смотрит в долину. Видно, как по верхушкам далёких сопок серебряной точки мелькает волчья спина, а за нею, всё, отставая, мчатся чёрные точки собак. Весь аул на ногах. Медно-красный сидит с ружьем на коне. Ему показывают на горы. Он кивает головой и обещает отомстить волкам.

Сравнение долины со скрученным канатом, степь широка и длина, в ней может произойти все что угодно, однако из-за одного ягненка весь аул на ногах.

Она поет, будто плещется при луне, переливаясь со скалы на скалу, горный ручей, а стада жуют и дышат, будто тысячи людей тихо идут по песку.

Степь -символ тишины, чистоты, одиночества для тех, кто хочет собраться с мыслями.

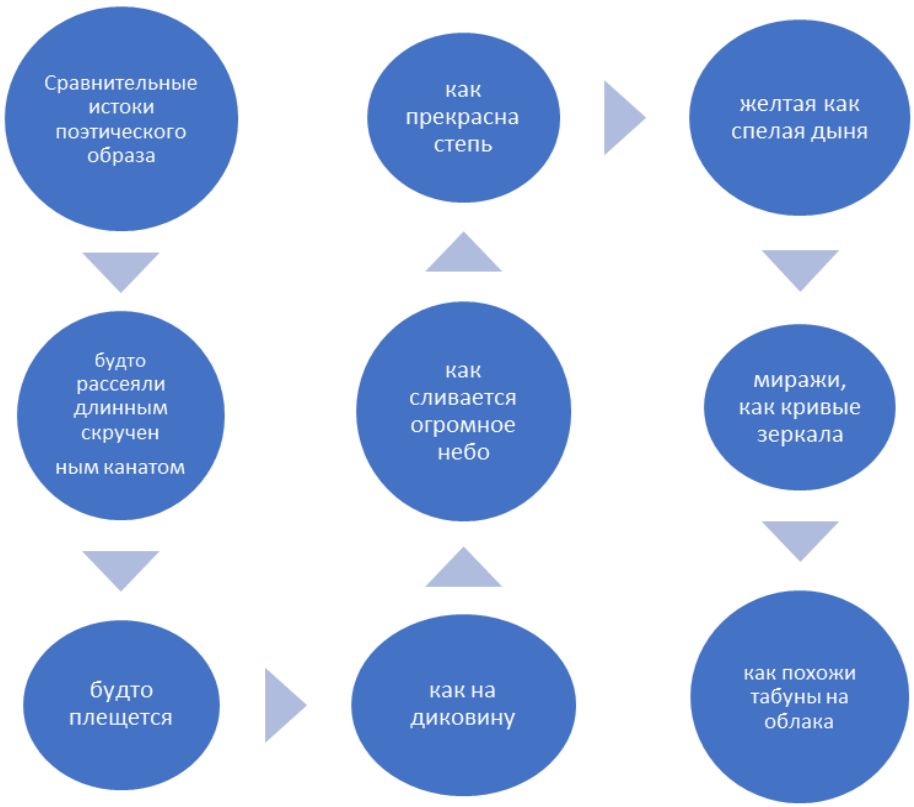

Рисунок 3.

Рисунок 4.

Специфика данного метода заключается в том, что использование таких карт дает развивать не только критическое мышление студентов, но и помогает по крупицам, по пятам, следам собрать нужную информацию и понять, что автор хотел показать и рассказать читателю, через национальную картину Востока. А это в свою очередь помогает студенту думать критически, проявлять любознательность, ставить перед собой вопросы и осуществлять планомерный поиск ответов. Исходя из вышесказанного, главная роль отводится тексту, студенты же учатся анализировать, обобщать и систематизировать мыслительные процессы при погружении в то или иное произведение, так и визуально запоминается легко и помогает определить информационное поле произведения.

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Issue Article

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LINGUOCULTUROLOGICAL COMMENTARY AND ITS LINGUODIDACTIC SIGNIFICANCE IN THE STUDY OF WORKS OF SMALL PROSE IN A FOREIGN LANGUAGE AUDIENCE (BASED ON THE MATERIAL OF V.P. ASTAFYEV'S STORIES FROM THE COLLECTION «ZATESI»)

Abstract: *The article examines the role of linguistic and cultural commentary as an integral component of working with a literary text in a foreign language audience. The linguodidactic significance of this type of commenting in the analysis of a work of art is also revealed.*

Key words: *prose, text, commentary.*

Language: *Russian*

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Scopus ASCC: *1208.*

ЛИНГВОКУЛЬТУРОЛОГИЧЕСКИЙ КОММЕНТАРИЙ И ЕГО ЛИНГВОДИДАКТИЧЕСКОЕ ЗНАЧЕНИЕ ПРИ ИЗУЧЕНИИ ПРОИЗВЕДЕНИЙ МАЛОЙ ПРОЗЫ В ИНОЯЗЫЧНОЙ АУДИТОРИИ (НА МАТЕРИАЛЕ РАССКАЗОВ В.П. АСТАФЬЕВА ИЗ СБОРНИКА «ЗАТЕСИ»)

Аннотация: *В статье рассматривается роль лингвокультурологического комментария как неотъемлемого составляющего работы с художественным текстом в иноязычной аудитории. Также раскрывается лингводидактическое значение данного вида комментирования при анализе художественного произведения.*

Ключевые слова: *проза, текст, комментарий.*

Введение

Комментирование текста является одной из самых распространённых форм работы с текстом в иноязычной аудитории. Область лингвокультурологии рассматривает то, каким образом языковые выражения (грамматика и лексика) отражают и формируют культурные ценности и нормы. Это позволяет понять и описать особенности мировоззрения и менталитета определенной культуры, что является неотъемлемой частью процесса лингводидактики.

В данной статье мы рассмотрим лингвокультурологические комментарии к национально-культурным реалиям русского народа, встречающимся в миниатюрах В.П. Астафьева «Затеси», а также определим лингводидактическое значение приведённых комментариев при изучении художественных текстов в иностранной аудитории.

Миниатюры В.П. Астафьева изобилуют пословицами, поговорками, фразеологизмами русского народа, которые, несомненно, являют собой концентрацию национальной картины мира и русского духа, что вызывает необходимость их обязательного комментирования. В произведениях В.П. Астафьева встречаются следующие пословицы, поговорки и

фразеологизмы, к которым мы составили лингвокультурологический комментарий, а также отметили их лингводидактическую направленность:

1) «Без хозяина и дом сирота» [1] - порядок и благополучие в доме может обеспечить только хороший и заботливый хозяин;

2) «лес рубят – щепки летят» [1] - выполнение любого крупного дела несёт за собой мелкие жертвы и потери;

3) «за три метра в земь видел» [1] - авторская интерпретация фразеологизма «видеть на три аршина в землю», где аршин – русская мера длины, равная 0.75 метра. Фразеологизм используется тогда, когда говорят о человеке проницательном, дальновидном, предусмотрительном. Но в контексте, который приведен в тексте, данный фразеологизм обозначает человека опытного, превосходящего в своём деле остальных;

4) «не живи сусеками, а живи соседями» [1] - ***сусек*** – место в амбаре для хранения зерна и муки, а также чан, кадь (ёмкость для хранения зернового хлеба) [5]. Поговорка означает, что иметь дружеские, хорошие отношения с соседями ценится выше, чем богатство.

5) *«могли подковать не только блоху…»* [1] - выражение стало популярным после выхода рассказа Николая Лескова, в основе которого лежала легенда о том, как из Англии в Россию была прислана маленькая стальная блоха, а тульский мастер Левша сделал для неё очень маленькие подковы, на которых ещё и выбил свои инициалы. Английские мастера были удивлены мастерством Левши и выразили восхищение его талантом. Фразеологизм «подковать блоху» используется в значении «проявить необычайное мастерство в каком-либо деле, высшая степень таланта» [7]. Лингводидактическое значение: прославление таланта и смекалки русского народа, уважение к чужому таланту.

6) «мёртвые сраму не имут» [1] - т.е. «мёртвые стыда не имеют». Как описывается в «Повести временных лет», автором которой является монах Нестор, это выражение сказал перед боем русский князь Святослав Игоревич. Выражение используется в нескольких значениях: 1) позор не должен коснуться мёртвых, 2) о мёртвых не следует говорить плохо [8], 3) потомкам не в чем упрекать мёртвых, так как они сделали всё, что в их силах [7]. Лингводидактическое значение: В контексте, в котором это выражение упоминается в произведении, автор иронизирует над тем, что в современном мире стыда не имеют не только мёртвые, но и живые люди.

7) «война не по лесу, а по народу» [1] - поговорка означает то, что все тяготы и лишения войны в первую очередь отражаются на жизни простого народа;

8) «чудеса в решете» [1] - ***решето*** – деревянный ободок, на который натянута сетка, предназначенный для просеивания муки или каких-либо других продуктов. В.И. Даль приводит следующий вариант пословицы: «чудеса в решете: дыр много, а вылезть негде (выскочить некуда)» [4]. В современном русском языке фразеологизм «чудеса в решете» используется, когда говорят о чём-либо удивительном и необычном, во что трудно поверить.

9) «*с плеча долой»* [1] - выражение стало известно благодаря комедии А.С. Грибоедова «Горе от ума»: «Обычай мой такой: Подписано, так с плеч долой [3]. Фразеологизм используется в тех случаях, когда говорят о деле, от которого хотят побыстрее избавиться.

10) «утёрла им всем нос» [1] - выражение означает «доказать своё превосходство в каком-либо деле» [9].

11) «забитые «под завязку» бараки» [1] - в данном контексте фразеологизм имеет значение «полностью заселенные бараки»;

12) «куда конь с копытом, туда и рак с клешнёй» [1] - так говорят о том, кто пытается сравняться в каком-либо деле с более опытным и знающим;

13) «ума нет – беда недалёко» [1] - синонимично выражению «глупость приводит к беде»;

14) «бабушкин аттестат» [1] - продовольствие, еда, самостоятельно добытая солдатами в деревне [11];

15) «против лома нет приёма» [1] - данная пословица имеет несколько вариантов: 1) против лома два приёма: лом на лом или бегом; 2) против лома нет приёма, окромя другого лома [2]. Говорится в подтверждение чужого преимущества либо в оправдание своей слабости: против грубой силы, имеющей в своём распоряжении подручные средства, сложно устоять. Но можно дать достойный отпор, использовав те же приёмы и средства, что и противник [6].

16) «лыжи правильно навострить» [1] - 1. Намереваться уйти куда-либо или откуда-либо. 2. Убежать, сбежать куда-либо или откуда-либо [10]. В контексте, приведённом в рассказе, фразеологизм имеет значение «найти (принять) правильное решение».

18) «кто рано встаёт – тому Бог даёт» [1] - пословица призывает бороться с ленью и начинать трудиться сутра, за это человек получит вознаграждение.

Часто в миниатюрах встречаются национально-культурные реалии, связанные с празднованием религиозных и государственных праздников, традициями и обычаями, распространёнными в определённых регионах

России. Так, в рассказе «Вербное воскресенье» можно познакомиться с традициями празднования этого праздника:

Вербное воскресенье – один из двенадцати основных праздников христиан. Другое название праздника – Вход Господень в Иерусалим. Празднование приходится на шестое воскресенье Великого поста за неделю до Пасхи (праздник в честь воскресения Иисуса Христа). Праздник отмечается в честь приезда Иисуса Христа в Иерусалим. По легенде, Иисус Христос въезжает в город на осле, а встречающие приветствуют его, застилают дорогу пальмовыми ветвями и поют хвалебную песню. В честь этого события в церквях принято освящать ветки пальмы, а в тех странах, где это дерево не растёт, пальму заменили на вербу. В России существует традиция освящёнными ветками вербы украшать дома и иконы, а потом хранить эти ветки целый год. Считается, что верба обладает целебными свойствами и оберегает от болезней, поэтому ветками вербы хлестали детей и животных.

В миниатюре «Свеча над Енисеем» встречается отрывок, в котором упоминается кулич, который является традиционной выпечкой при праздновании главного христианского праздника Пасхи: *«Напротив села, на скале, обкатанной дождями и временем, похожей на запекшийся кулич...»* [1]:

Кулич – сладкий высокий хлеб из сдобного теста цилиндрической формы, верхушка которого украшается сладкой глазурью. Куличи являются традиционным кушаньем при праздновании Пасхи, которую отмечали в честь воскресения Иисуса Христа. Также Пасха являла собой окончание Великого поста. Куличи принято было выпекать в убранном доме, поэтому их пекли в пятницу после Чистого четверга, когда принято наводить порядок дома и посещать баню. В субботу куличи, окрашенные и расписанные праздничными узорами яйца и творожные пасхи принято освещать в церкви. Есть куличи принято в воскресенье после службы в церкви, разрезая их поперёк.

В миниатюре «Серёжки» автор упоминает о таком явлении как «сретенские морозы», что также связано с религиозными праздниками христиан: *«После сретенских морозов, когда разломится зима пополам и солнце повернет на весну…»:*

Сретенские морозы – последние дни, когда бывают заморозки. Сретение Господне – праздник, который отмечают 15 февраля в честь сретения (встречи) на сороковой день после рождения Иисуса Христа со святым Симеоном и Анной. Согласно библейской легенде, Симеон должен был жить до тех пор, пока не встретиться с Мессией. На момент встречи Симеону было 300 лет. В народном календаре этот день считали днём первой встречи весны. С этим днём связано также множество примет: если метет снег или на небе много белых звёзд — будет поздняя весна. Оттепель на Сретение считалась к сырой и дождливой весне, а также к неурожайному году; метель – к поздней весне, к скорому окончанию запасов корма; ясный, хорошо заметный закат – предвестник окончания морозов и т.д.

Помимо религиозных праздников, в миниатюрах можно встретить традиции празднования государственных праздников. Одной из таких миниатюр является «Праздник солидарности»: *«Этой газете, как и всем советским райгазетам, полагалось в майские праздники, точнее в* ***День печати****, проводить городскую спортивную эстафету.*

Стоило бы описать и грандиозный праздник солидарности, и патриотическое возбуждение народа в задымленном трудовом городке, погруженном почти в полумесячное безделье, потому как ***именно в мае сосредоточились праздники один важнее другого****…»* [1].

Лингвокультурологический комментарий*:*

1. День печати – отмечался 5 мая, связан с выходом в 1912 г. газеты «Правда», а с 1914 года организован праздник дня рабочей печати.

2. Именно в мае сосредоточились праздники один важнее другого. Май является месяцем, включающим в себя большое количество праздников, среди которых: 1 мая – День солидарности трудящихся, 5 мая – День печати, 9 мая – День Победы. Существовала традиция проводить праздники на открытых площадках, связывая их со спортивными мероприятиями и сопровождая различными демонстрациями, плакатами и т.д.

Знакомство с традициями празднования различных праздников и обычаями, связанными с ними имеет также большое лингводидактическое значение, так как они содержат в себе значимый философский подтекст. Вызывая размышления студентов над философской составляющей текста, можно приводить их к собственным выводам и умозаключениям, что будет способствовать лингводидактической цели изучения произведения. Таким образом, можно сделать вывод о том, что лингвокультурологический комментарий и лингводидактика являются неотъемлемыми компонентами при работе с художественным текстом в иностранной аудитории.

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Issue Article

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THE ROLE OF CIVIL SOCIETY IN THE DEVELOPMENT OF DEMOCRATIC PROCESSES

Abstract: *The 90s of the 20th century were characterized by a significant increase in the number of regimes that conducted politics through specific elections. In 2009, electoral democracy was recorded in 116 countries; Significantly more than 20 years earlier, when there were a total of 69 such countries. It is true that specific electoral systems are necessary for democracy, but they are not sufficient. Many new democracies, while holding such elections, fail to create a representative government accountable to those under its jurisdiction. Such democratic systems lack the trust and love of the citizens, decisions are made by the elite under the pressure of a well-organized interest group.*

Electoral democracies can work to produce representative and sympathetic governments. To ask this question is to understand how people come together to define their interests and viewpoints, inform governments, hold them accountable, and engage in goal-oriented action for the good of society. Elections are necessary for institutions to function. Strong civil societies provide a context in which elections are conducted democratically; It is important that strong civil societies and functioning democracies interact so that they are mutually reinforcing.

Civil society is a sphere of purposeful, normatively based associations, so it is the foundation of democracy as well as competitive, fair, transparent, periodic elections.

Key words: *Civil society, democracy, direct democracy, representative democracy, citizen, elections.*

Language: *English*

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Introduction

One of the most widespread definitions of civil society belongs to Larry Diamond. Civil society is a field of organized public life that is self-generating, self -developing, autonomous from the state and bound by a legislative order or a set of shared rules.

In addition, there are other definitions, although general; Civil society - this is a type of voluntary organization of society, where ordinary citizens are usually actively involved in public life. The activity does not include only one direction. The area of this activity is very wide and includes any problematic areas for the society, be it social, cultural, economic, environmental or other areas. Civil society is a field of human organization that gives wide scope to competition. At the same time, it implies the function of initiation and control, and its competence does not and cannot include activities that are uniquely the duties of the state: legislation, judicial proceedings, defense, security and law and order, foreign affairs, relations or the implementation of executive power.

Civil society is not placed either in the private (family) sphere, nor in the business or state sectors. "It is an intermediate link between private interests, individuals or social strata on the one hand, and the state and its institutions on the other hand. It is because of this "intermediate link" that the civil society often has the so-called They are also considered to carry the function of a conductor, a mediator". [Burrows G, Dfa et al (2020), Democracy and Citizenship, Vol. p. 164]. The given role of the civil society is manifested in its function - to aggregate the impulses and demands

from the society and to be able to bring the given demands to the authorities in an already established form.

"The potential role of civil society in enhancing democracy comes into focus when the institutional definition of democracy is subject to a normative conception of what democracy is supposed to achieve... The institutions, organizations, and practices that constitute democracy provide opportunities for those who have potential affect collective decisions to be affected by them4" [Oxford Handbook of Civil Society, (2011), edited by Edwards M, tbv, p. 391] .

In general, some of them are distinguished from the main factors of the existence of civil society. In particular, these factors are:

- Freedom and quality of association;
- developed and strong local governments;
- Decentralization of social or other obligations.

Consider each of them:

1. People unite in different types of organizations on their own initiative. The state promotes this kind of association with relevant legal regulations. (meaning a democratic state). A state where human freedoms and duties are not only written on paper, but also implemented in real life. Democracy is based on people's rule and based on people's consent or consensus. The source of the government's legitimacy is the people. "Democracy is a simple idea with a strong appeal. Government should be based on the consent of the governed. [Branson M, Schechter S, Wonzi T. (2008), Research of Political Ideas, Vol., p.3]

Accordingly, it is in the interests of the democratic state itself to have a strong civil society. Despite the existing opinions that the modern type of civil society is the firstborn of the second half of the 20th century , it is a fact that various types of voluntary public associations appeared earlier in Europe and America. For example, voluntary associations in the Greco-Roman world even before BC. It can be found in the 6th century AD, from the period of Solomon, and it reached a special flowering period during the Hellenistic period. In the Greco-Roman world, there were different types of voluntary associations. Among them, we can single out: philosophical associations, public religious associations and others.

Similarly, similar types of civil associations and unions are widespread in medieval Europe - be they guilds, guilds, or other types of unions.

An active civil society, that is, a society that is not focused on material gain and is not engaged in any kind of business or commercial activity, is one of the guarantees of public stability in a state where citizens have the right to freely express their interests and fight to protect these interests within the law - the society is more harmonious. , stable and balanced.

2. Citizens' involvement in public activities is largely determined by local self-government bodies. The existence of effective local bodies conditions the wide involvement of citizens at local levels - local councils, councils, elected bodies. Local government is the guarantor of legitimacy.

3. The state has certain duties before the society - be it social, economic, legislative or other types of duties. According to the liberal theory of the state, people create society for the purpose of fulfilling certain obligations and refuse the right to absolute freedom precisely because of the fulfillment of these obligations. However, in a democratic state, one of the characteristics of which is the existence of a strong civil society, the state delegates certain rights and obligations. "At least in theory, the state expresses the permanent interests of the society: that is, the common universal will." [Heywood E, (2008), Politics, University of Georgia, Herald of Georgia, Tbilisi, p. 16]: "It is clear that everyone aspires to some good. The best union, which includes everything, strives for the highest good, and this is the so-called State and State Union". [Brachuli I, et al., (2015), Introduction to Philosophy, Tbilisi, Meridian, p. 326].

What types of associations are considered in civil society? In order to answer the mentioned question, let's define the constituent areas of civil society:

1. Civil society includes those forms of activities and social relations that do not fit into the family sphere. Civil society is uniquely public space, therefore it goes beyond narrow close, friendly or family relations.

2. Civil society refers to the form of activities and social relations that do not belong to the sphere of business.

3. The activity of civil society and the form of social relations are beyond the competence of the state.

4. Although political parties are the type of associations whose main goal is to come to power, parties are also intermediate type of organizations, one of whose functions is to establish a connection between different segments of civil society.

5. Mass media. We mentioned above that the spheres of activity of business and the state are not among the spheres of activity of civil society. However, in modern reality, it is difficult to completely separate these areas. By their very nature, mass communication media are business groups, because they are profit-oriented, commercial benefit-oriented associations. Media is the field of activity that most mobilizes society around this or that problem. That is why mass media is often referred to as a constituent part of civil society (the fourth government).

6. Trade unions. Like the media, trade unions are quite interesting associations within civil society of members of professions engaged in wage labor - regardless of whether the employer is a government or private business.

7. Associations, churches or groups based on religious beliefs. As free, voluntary and non-profit organizations united around their interests, they are clearly included in the broad spectrum of civil society, but their members themselves are less likely to think of themselves as a constituent part of civil society.

8. This category includes various private associations (for example, golf clubs, football clubs or other sports associations, clubs).

The concept of civil society, in general, arose in the liberal heart, therefore, liberal values are decisive in defining the concept of civil society.

In general, the democratic government creates normal conditions for the existence and functioning of civil society. Here it is legitimate, because the law does not prohibit it, but rather protects it. Although the government does not create and does not interfere in the activities of civil society organizations. But it establishes the legal framework within Romney's framework they operate independently and freely. The government does not manage, but regulates the activities of civil society. The basis of this regulation is the Constitution and its corresponding legislative acts.

One of the important tasks of the civil society is to control the activities of the government. The fact is that the government often increases its authority, as a result of which there is an abuse of power. He fully uses his rights and, but cares less about the fulfillment of obligations. For example, the government is obliged to protect human rights, but often violates them; It is obliged to protect legality, but it itself commits illegality, it is obliged to fight corruption, but there are many bribers hiding in its structures, etc.

It is true that the civil society cannot change the government, it cannot fulfill its function, but it has the right to exercise control in order to influence its activities. "Exposure and criticism, recommendations and constructive cooperation, protest statements and peaceful demonstrations - these are the main means by which civil society can force the government to protect social justice and human rights. Of course, they will not be able to establish an ideal situation in the country with these means, but they will limit the state as a mechanism of coercion. [Mamukelashvili EL, Akhalmosulishvili T, (2010), Political Science, Vol. Universal, p. 324]

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Issue Article

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HIDROCHEMICAL ANALYSIS OF SOME FRESH WATERS OF LEJOKHE, LETANE AND MIKAWA VILLAGES OF TSALENJIKHA MUNICIPALITY

Abstract: *In the studied spring waters of Lejokhe, Letane and Mikawa villages of Tsalenjikha municipality, the content of* Mg^{2+}, Ca^{2+}, HCO_3^-, Cl^-, SO_4^{2-}, CO_2, *permanganate oxidizability, oxygen and dry balance is within the norm and its use for drinking and economic purposes is appropriate.*

Key words: *water, titration, equivalent, hardness, Gravimetry.*

Language: *English*

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Introduction

Water has no taste, no color, no smell, it is necessary for life. Water is the greatest wealth of this country. There is no pure water in nature. Water is a good solvent and dissolves the substances it touches in its circulation. Gases are mainly transferred from the air into it, and solid substances from rocks and minerals. Many substances that are insoluble in water are mechanically mixed with it and adhere to a suspended or colloidal state. When water reaches the deep layers of the earth, it is affected by high temperature and pressure, which helps to dissolve substances.

Air plays a major role in the formation of the water composition of the soil, which causes atmospheric precipitation to enter the water. The surface cover of the water layer, on which the penetration of atmospheric precipitation depends, is of great importance. The composition of soil water is influenced by the sanitary condition of its upper horizon. Many substances are mixed with industrial effluents and enrich its composition. As a result of such processes, many solid, liquid and gaseous substances accumulate in water [1, p.3-10].

As water moves through the earth's crust, it touches various rocks and minerals, which are accompanied by chemical transformations. At this

time, the ions exchange and the ions present in the water move into the rocks, instead, other ions of the same charge are dissolved from the rocks into the water [2, p. 120-122; 3 p.1].

In the transformations taking place in water, free oxygen plays a big role, which enters it from the air and participates in oxidation processes both directly and with the presence of microorganisms. Different waters touch different substances and therefore they differ in chemical composition. When groundwater rises to the surface, gases are released from it as a result of the pressure drop. For example, as a result of the release of carbon dioxide from water, the carbonic acid-carbonate balance is disturbed. At this time, calcium and magnesium hydrocarbonates are transferred to hard-to-dissolve compounds and precipitate [4, p. 35].

Tsalenjikha is bordered by Mestia to the north, Gali to the west, Zugdidi to the southwest, and Chkhorotsku to the southeast.

The northern part of the district is wide and mountainous, the southern is a narrow, plateau-like plain, the mountainous part includes the ridges and deep valleys of the southern slopes of the Egrisi and Kodori ridges. The mountainous part of the district is surrounded by numerous tributaries of Egrisi and Chanistkali, numerous tributaries with deep canyon-like valleys.

The district is located in the coastal climatic district, at the same time, due to the mountainous area, high-altitude climatic zones are expressed here, in the plains and in the hilly foothills there is humid, subtropical weather, with warm winters and hot long summers. Enguri and its numerous tributaries are Chkhina, Eitsi, Olori, Khuberi and Magana. Rivers Jumi and Ochkhomuri also flow in the territory of the district. Rivers are fed by rain, snow and groundwater. Flooding is known in spring and autumn, water scarcity in winter. There is a lake in the district - Tobavarchkhili. Among the mineral waters, the most important is Skuri

Purpose. We aimed to study the hydrochemical composition of some fresh waters of Lejokhe, Letane and Mikawa villages of Tsalenjikha municipality. We consider the importance of magnesium and calcium ions in managing the life processes of human, animal and plant organisms. The aim of our research was to study the content of Mg^{2+}, Ca^{2+}, HCO^{3-}, $SO4^{2-}$, CO_2, oxygen and biogenic elements in the waters of some springs of Lejokhe, Letane and Mikawa of Tsalenjikh municipality. The relevance of the issue lies in the fact that the content of the above-mentioned ions was determined for the first time in these waters, for which highly sensitive methods were selected [5, p.124-126; 6, p.128-129].

Experimental part. Methodology for determination of chemical elements in water

The analyzes were carried out in the Analytical Chemistry Laboratory of Kutaisi Akaki Tsereteli State University. Methods tested in hydrochemical practice were used for the analysis [7, p.310-311].

The acidity rate was measured by the potentiometric method (Potentiometer pH 673-M).

The mercurimetric method was used to determine chlorides (titrant 0.01 $Hg(NO_3)_2$ indicator (diphenyl carbazole).

Hydrocarbons were determined by the acidimetric method (titrant 0.1-0.01 N HCl indicator methyl orange. The content of calcium and magnesium, as well as the total hardness of the water under investigation, was determined by the complexonometric method (titrant 0.01N complexon III. To determine the magnesium ion content, we used eriochrome as an indicator, we created the recommended area with an ammonia buffer, and to determine the calcium ion, Merexide was used as an indicator. We created an alkaline area with 2N sodium alkali.

Sulfate ions and dry balance were determined by the classical gravimetric method, representing a sedimentary form $BaSO_4$.

Carbonic acid gas was determined by the alkalimetric method. Titrant 0.1-0.01N $NaOH$. Indicator Phenophthalein.

Oxidability was determined by the permanganatometric method (oxidizing agent 0.01 N $KMnO_4$, in acidic area. Titrant 0.01 N $H_2C_2O_4$).

The content of oxygen and JBM5 was determined by the iodometric method (titrant 0.01 N. $Na_2S_2O_3$ In an alkaline environment, $Mn(OH)_2$ is oxidized by oxygen dissolved in water and transferred to a tetravalent manganese compound, which is formed when the solution KI is acidified in excess I_2).

Biogenic substances were determined by photometric method: NO_2^- shell reagent, NO_3^- sodium salicylate, NH4+ - Nessler's reagent, PO_4^{3-} - ammonium phosphorolybdate.

Photometric determination of NO_2^- using Gries's reagent in the acid zone is based on the formation reaction of a reddish-brick colored azo dye as a result of the interaction of sulfanilic acid, nitrite ion and alpha-naphthylamine.

NO_3^- was determined by photocolorimetric method using sodium salicylate. The method is based on the interaction between nitrate ions and sodium salicylate ions, in the presence of sulfuric acid, during which the resulting yellow coloration is directly proportional to the nitrate ion concentration.

The determination of NH4+ is based on the interaction between the ammonium ion and Nessler's reagent (mercury tetraiodide) in the alkaline zone, during which the resulting yellow coloration is

directly proportional to the concentration of the ammonium ion.

PO_4^{3-} was determined by the photocolorimetric method, which is based on the interaction of orthophosphoric acid and ammonium molybdate in the acid zone, during which the blue color formed is directly proportional to the phosphate concentration.

Results and discussion

Thus, for the first time, the hydrochemical composition of the waters of the villages of Lejokhe, Letane and Mikawa of the municipality of Tsalenjikha was determined. The content of magnesium, calcium, hydrocarbonate, chloride, sulfate ions, nitrogen dioxide and oxygen was determined. Permanganate oxidizability, JBM5, dry balance and biogenic elements were also studied - by chemical and photometric methods. The results of the analysis are given in Table N 1.

Table N 1. Results of hydrochemical analysis of some fresh waters of Lejokhe, Letane and Mikawa villages of Tsalenjikha Municipality

N	Regional names of spring waters	*pH*	Mg/L									
			SO_4^{2-}	Ca^{2+}	Mg^{+}	HCO_3^{-}	Cl^{-}	Dissolved oxygen	JBM_5	Permanganatometric oxidizabilit	CO_2	Dry balance
1	Tsalenjikha	6,81	0.082	2,32	0,18	3,08	3,50	7,86	2,52	0,24	1,08	1,57
2	Beka's	7,42	0.120	3.11	0,32	3,62	2,48	6,45	2,22	0,64	1,62	1,60
3	Kostia's	6,54	0,164	0,44	0,12	0,78	2,24	5,81	1,66	1,26	0,38	1,25
4	Borisi's	6,04	0,081	0,64	0,13	0,64	1,82	7,08	1,88	0,16	0,31	1,16
5	Lado's	5,93	0,206	0,48	0.61	0,28	2,38	9,22	3,52	2,64	0,18	1,19
6	Berdia's	7,15	0,241	2.34	0,08	2,16	2,48	3,17	2,112	1,52	1,16	1,33

In the spring waters we have examined, the *pH* varies in the range of 5.93-7.42.

The highest amount of magnesium ion is contained in the Lado spring at 0.64 mg/l. Its content is the smallest in Berdiya spring at 0.08 mg/l.

TheCa^{2+} ion content is also variable. A relatively large amount of it was recorded in the spring of Beka at 3.11 mg/l, while its content was low at 0.44 mg/l in the spring of Kostya.

The HCO_3^- ion content is the largest in the Beka spring at 3.62 mg/l, the content of hydrocarbonate ions is the smallest in the Lado spring at 0.28 mg/l.

A high SO_4^{2-} ion concentration is recorded in the Berdia spring at 0.241 mg/l. A small amount of sulfate ions is contained in the Borys spring at 0.081 mg/l.

Chloride ions are contained in a relatively large amount in the Beka spring, 3.50 mg/l. And its mass content is small in Borys spring at 1.82 mg/l.

The content of carbonic acid gas is the highest in the spring of Beka, 1.62 mg/l. The Lado spring contains a small amount of carbonic acid gas, 0.18 mg/l.

Permanganate oxidizability is relatively high in the Lado spring at 2.64 mg/l, its small amount is recorded in the Tsalenjikha spring at 0.24 mg/l.

The oxygen content is high in the Tsalenjikha spring at 7.86 mg/l. A relatively low concentration of oxygen is recorded in the Berdia spring at 3.17 mg/l.

The dry balance is the highest in the Beka spring at 1.60 mg/l. Its content is the smallest in the source of Kostya at 1.66 mg/l.

JBM_5 is the highest in Lado spring at 3.52 mg/l, the lowest in Kostya spring water at 9.46 mg/l.

The content of biogenic elements NO_2^-, NO_3^-, NH_3, PO_4^3 is lower than the detection limit, and their content is not recorded in the investigated fresh water of Lejokhe, Letane and Mikawa villages of Tsalendzhikha municipality.

Conclusion

In the studied spring waters of Lejokhe, Letane and Mikawa villages of Tsalenjikha municipality, the content of Mg^{2+}, Ca^{2+}, HCO_3^-, Cl^-, SO_4^{2-}, CO_2, permanganate oxidizability, oxygen and dry balance is within the norm and its use for drinking and economic purposes is appropriate.

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Issue Article

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METHOD FOR GENERATION OF NEW POROUS MATERIALS BASED ON TRIPLY PERIODIC SURFACES

Abstract: *A new method is proposed for generation of porous materials, which is based on triply periodic surfaces (TPS) derived from topological network representation of crystal structures of chemical compounds. A model of the porous material based on the sodalite crystal structure is generated, samples of the material are manufactured by 3D printing.*

Key words: *triply periodic surfaces, additive manufacturing, porous material.*

Language: *English*

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Introduction

Modern technologies widely use materials with porous structure of various types and dimensions [1]. An important group of such materials, which attracted attention in the last years, is based on smooth triply periodic surfaces (TPS) with diverse topological and geometrical structure [2, 3]. The interest to these materials is primarily caused by their thermal-conductive, electrical-conductive, acoustic, and vibration-isolating properties [4, 5], as well as by their ability to adsorb strain energy [6–11]. Filling pores with the materials to be different from the skeleton base material enables one to fabricate new composite materials and metamaterials with wide range and considerable anisotropy of physical properties. The mentioned features together with the Additive Manufacturing (AM) technology make the TPS materials an indispensable part of modern engineering solutions and thus are a subject of intense theoretical and experimental studies.

However, the number of TPSs currently used in the development of porous materials is quite limited, and the task of generating new TPSs is vital [12]. In this paper, we describe a new method for the generation of TPS-based porous materials derived from topological network representation of crystal structures of chemical compounds, in particular, zeolites [13, 14]. The theoretical background of this method is described in detail in [15]. This approach enables one to generate an unlimited number of TPSs and the corresponding porous materials using the *ToposPro* program package [16]. After a certain thickness is attributed to the surface, it can be 3D printed, and its physical properties can be explored with a computer-aided engineering (CAE) system like the ANSYS software [17], and studied experimentally.

The procedure for porous material generation based on triply periodic frames structured from natural crystals

A new *network approach* for generating triply periodic surfaces was developed, which is based on crystal structures of chemical compounds. This approach includes the following steps, all of which can be performed with *ToposPro*:

(i) Constructing a periodic net for a given crystal structure by determining interatomic bonds with the universal *Domains* algorithm [18] (Fig. 1 top left).

(ii) Building *natural tiling* for the net following a rigorous algorithm [19]. The natural tiling consists of polyhedral cages (*natural tiles*, Fig. 1 top right), which are confined by rings of the net (natural tile faces). The natural tiles possess an important property: they are minimal cages in the structure, and any other cage can be assembled from several natural tiles.

(iii) Generating TPSs from the natural tiling by the enumeration of all such ways of removing natural tile faces when the set of remaining faces obeys three conditions: (a) *decoration condition*, which requires that all net vertices and edges must lie on the TPS; (b) *edge condition*, according to which any edge of the net is shared by strictly two faces from the set; (c) *vertex condition*, which states that all edges meeting at the same vertex are shared by different pairs of faces. These conditions ensure that the resulting set of faces forms a single TPS without self-crossings (Fig. 1 bottom).

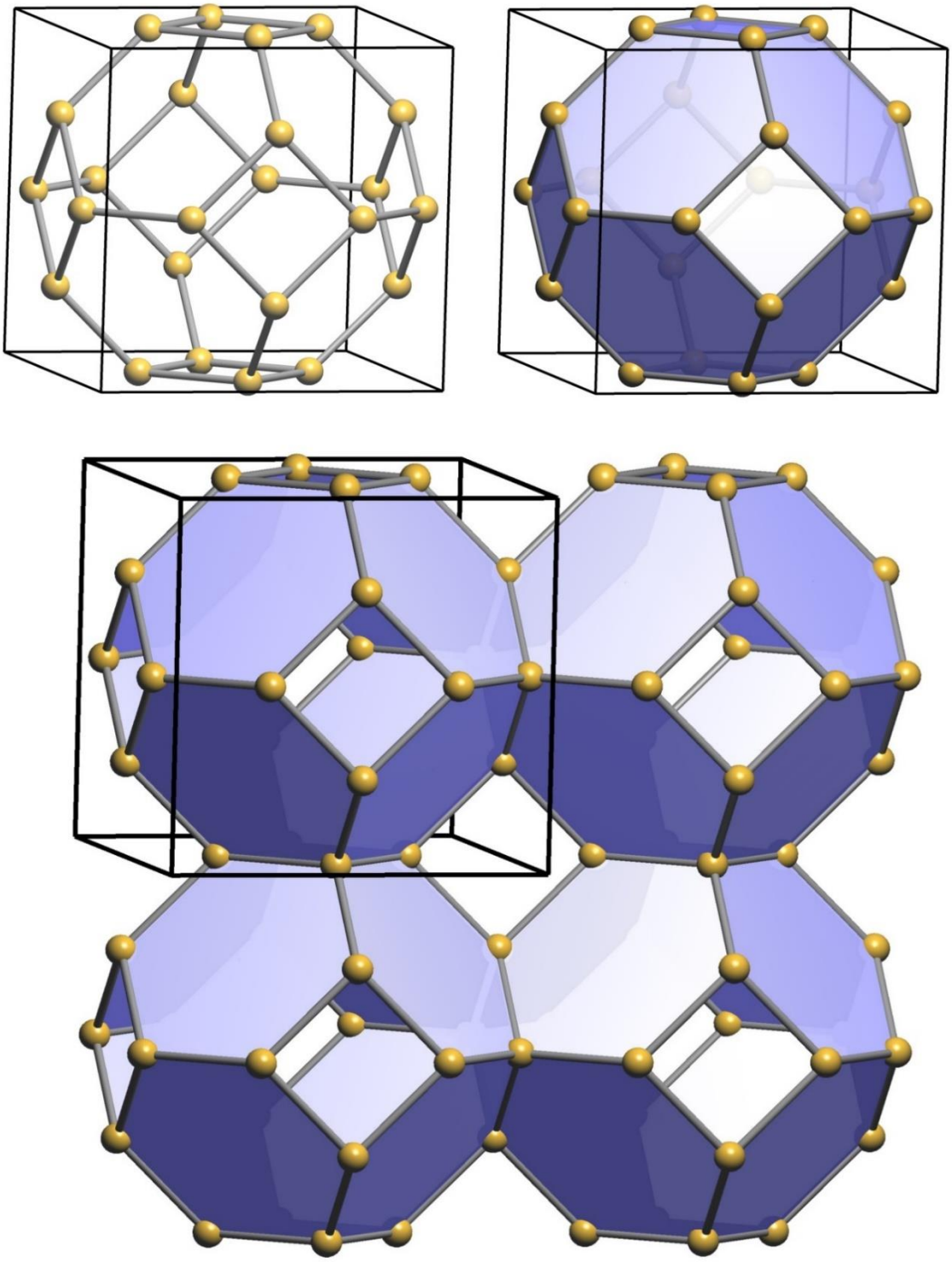

Figure 1. Zeolite sodalite (SOD) crystal structure: (top left) a fragment of periodic net in the unit cell; (top right) a natural tile confined by 4-membered and 6-membered rings of the net; (bottom) the triply periodic surface generated by removing the 4-membered rings and represented by the 6-membered facets.

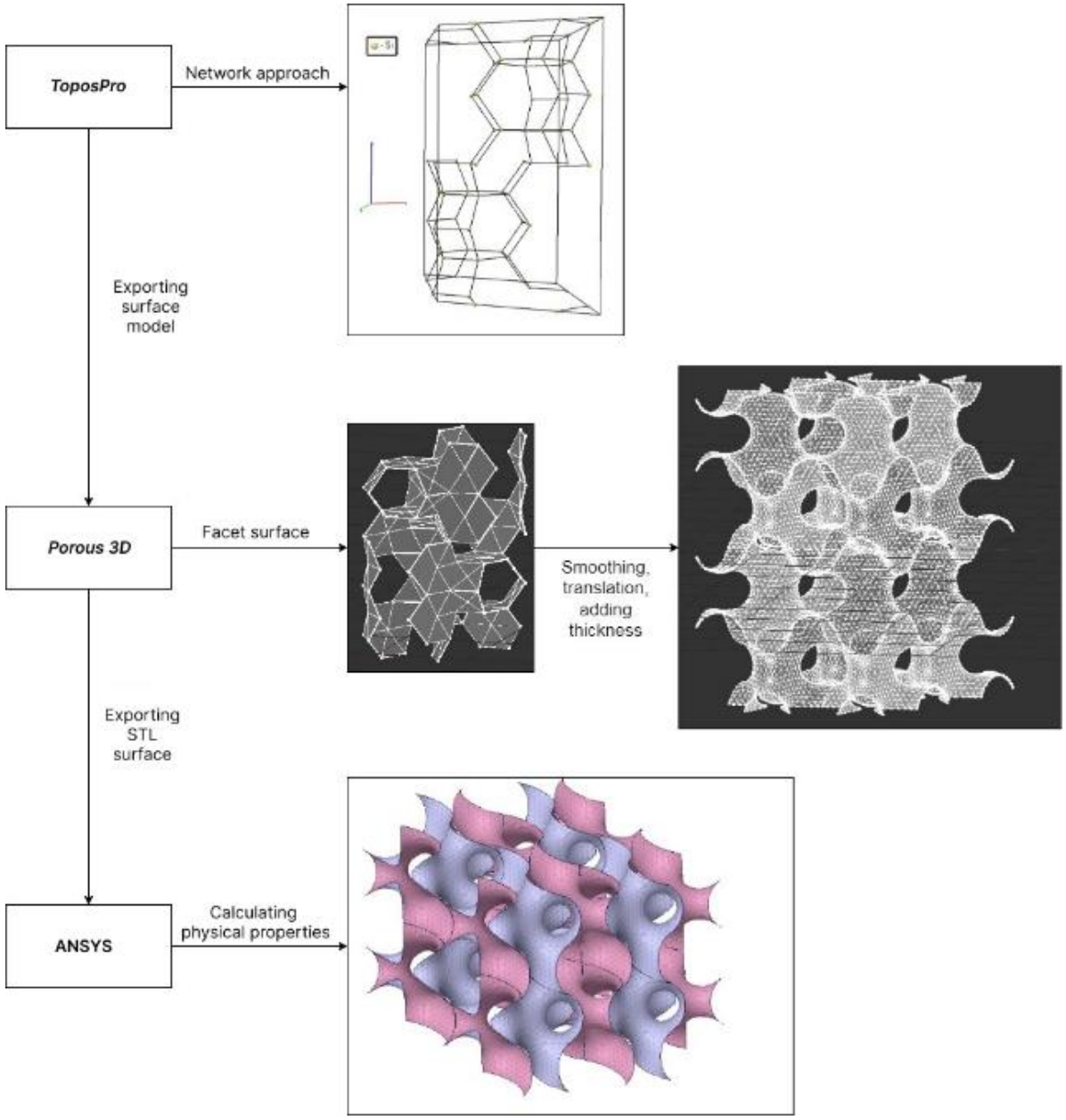

Figure 2. Schematic representation of the procedure used to generate a mathematical model of a porous material based on the AFG zeolite structure and to theoretically study its mechanical and thermal properties using *ToposPro, Porous 3D,* and ANSYS software.

The resulting TPS divides the space into two non-crossing parts (labyrinths), which can be equivalent if the TPS is minimal and balanced [20]. Geometrically, the TPS obtained in this way has a facet structure and needs smoothing to gain a minimal mean curvature. Since the number of periodic nets is infinite, and more than 800,000 of them have been stored in the *TopCryst* database [21], this approach provides an unrestricted opportunity for generation and discovering of new TPSs, which can serve as templates for porous materials and metamaterials. Some of new TPSs were obtained in [15], and a database with the mathematical models of these TPSs was created. We have used the information from this database to fabricate porous materials in this work (Fig. 2).

Let us discuss this procedure in more detail. The TPS facet model generated by *ToposPro* is output to a textual .t3g file, where the coordinates of all facets (rings) are given (Fig. 3).

```
1  AFG: 3D surface formed by rings: ◇4a, ⬢6a, ⬢6c, ⬢6d, ⬢6f
2  12.54800 (a)   12.54800 (b)   20.78900 (c)
3  90.00 (α)  90.00 (β)   120.00 (γ)
4  RING 4  a
5  0.08890  0.67060  0.37460
6  0.00350  0.75340  0.25000
7  0.24660  0.99650  0.25000
8  0.32940  0.91110  0.37460
9  ...
```

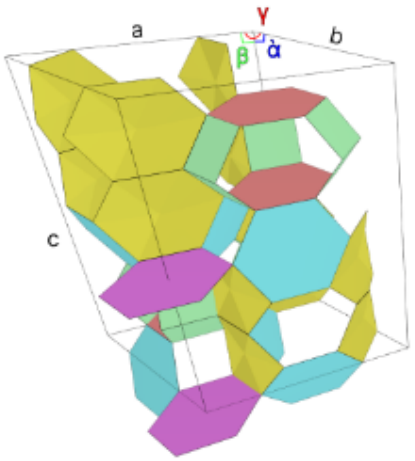

Figure 3. The .t3g-format file generated by *ToposPro* for a triply periodic surface represented by one 4-membered and four independent 6-membered rings of the periodic net obtained for the AFG zeolite crystal structure as well as dimensions and angular parameters of the unit cell.

Line 1 contains the periodic net name (AFG) and all independent (symmetry-inequivalent) rings (4a, 6a, 6c, 6d, 6f), which were used to compose the TPS.

Lines 2 and 3 specify the dimensions and angular parameters of the unit cell.

Line 4 starts the description of a TPS facet with the RING keyword followed by the size and type of the facet (4a);

Lines 5 – 8 record the coordinates of the net vertices, which form the facet; the coordinates are expressed in fractions of the unit cell dimensions.

The remaining lines are similar to lines 4 – 8 for all other facets in the unit cell.

To visualize, smooth and thicken the TPS model described in a .t3g file as well as to export the resulting smoothed and thickened model into a 3D printable STL-format file we have developed the *Porous 3D* software [22], which is based on the following algorithms.

Model translation algorithm. Obtaining an infinite TPS implies gluing boundaries of the adjacent unit cells. For this purpose, parallel translation in space in rectangular coordinate system *(x, y, z)* is implemented analytically using the following method (1):

Let *S* be the model that needs to be translated and $S(p_i)$ is a vertex of this model. To translate *S*, we need to calculate the translation matrix *T* based on the unit cell parameters *a*, *b*, *c*, α, β, γ:

$$T = \begin{pmatrix} a & b\cdot\cos(\gamma) & c\cdot\cos(\beta) \\ a\cdot\cos(\beta) & b & c\cdot\cos(\alpha) \\ a\cdot\cos(\alpha) & b\cdot\cos(\beta)\cdot\cos(\gamma) & c \end{pmatrix} = \begin{pmatrix} t_1 \\ t_2 \\ t_3 \end{pmatrix} \quad (1)$$

So, using calculated vector we can translate *S* in any direction along t_1 (2.1), t_2 (2.2), t_3 (2.3) like this:

$$t_1 : \sum_0^n S(p_i) + nt_1 \ (2.1)$$

$$t_2 : \sum_0^n S(p_i) + nt_2 \ (2.2)$$

$$t_3 : \sum_0^n S(p_i) + nt_3 \ (2.3)$$

where n is the number of models needed along translation vector (Fig. 4).

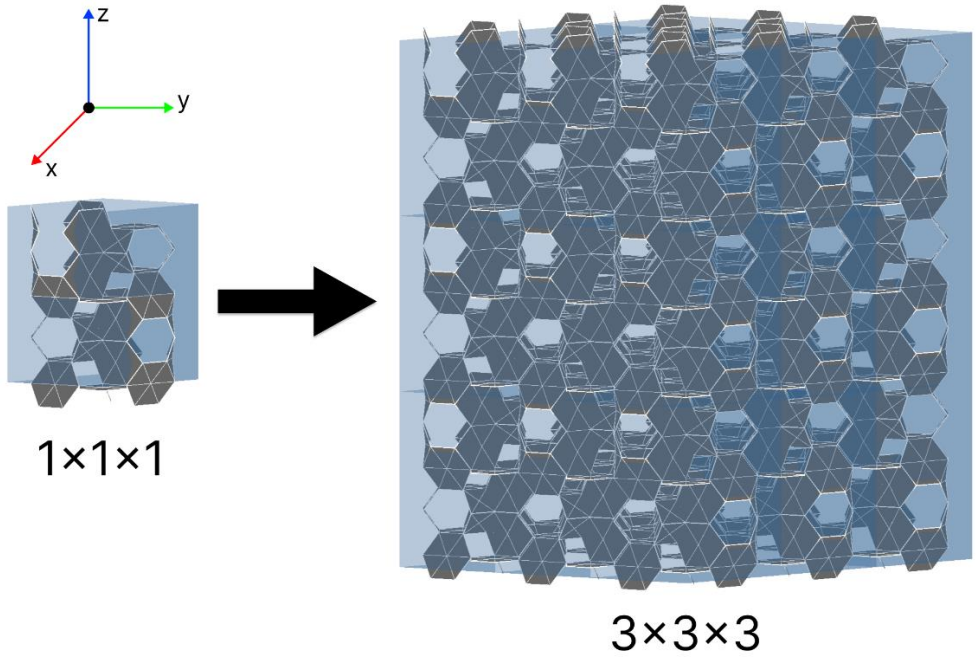

Figure 4. Translating and gluing 27 of unit cells of a TPS model generated from the AFG zeolite net. The boundaries of the internal unit cells (highlighted in cyan on the left) were removed after translating.

Facet smoothing algorithm combines Laplacian-based and optimization-based smoothing methods and minimizes the modulus of the difference between the maximum and minimum values of the mean curvatures calculated at all vertices of the surface mesh [15]. The mean curvature is calculated with the Delaunay triangulation and theory of normal cycles of differential geometry [23].

Surface thickening algorithm. Assigning thickness to a surface is made in two steps. At the first step, all points of the surface are moved along their normal vectors to a specified distance and a copy of the original surface is generated based on the moved points. At the second step, additional polygons are created to fill the gaps between the original surface and the copy to provide continuous volume.

For further investigation of physical properties of the porous material the model could be converted from STL to the Parasolid solid-state geometry format using the SpaceClaim software module of ANSYS [17].

Note that other recent studies [4, 5, 7-11, 24-26], where TPS surfaces were used for the modeling of porous materials, applied an analytical formula for constructing this TPS. Our method does not need any TPS analytical representation and, hence, we can also use those new TPSs obtained by our approach, which have no analytical description yet.

Thus, the theoretical part of our investigation included the following steps:

1. A triply periodic net is constructed using the crystallographic data on a crystal structure and *ToposPro*.
2. Facet TPSs are generated from the net with *ToposPro*, and the information on each TPS is exported into a .t3g file.
3. The data from the .t3g file are imported into *Porous 3D* and the facet TPS model is multiplied by translations, smoothed, thickened and exported into a .stl file.

The STL model could be imported to ANSYS to study thermophysical and mechanical properties of the model.

Conclusion

The new approach for generation of porous materials which based on triply periodic surfaces (TPS) is developed. The approach contains, firstly, the procedure for constructing the TPS. TPS are derived from topological network representation of crystal structures of chemical compounds in *ToposPro* software package. *ToposPro* produces surfaces bounded by various polygons, which divide the space into two non-crossing parts (labyrinths). Secondly, the resulting TPS is smoothed, taking into account the condition of minimal average curvature. At the third step, the surface is given the required thickness and it is converted into a format suitable for 3D printing and for use in applied calculation packages such as ANSYS, for example.

Developed approach provides one an unrestricted opportunity for generation and discovering of new TPSs, which can be templates for porous materials and metamaterials. A database of porous materials and tools for working with them have been created in the work.

So, the results obtained in the present paper give opportunity to state high efficiency and great opportunities of the suggested approach to generation of new porous materials as well as in theoretical and experimental studies of their physical properties.

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Issue Article

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DEMOCRATIC DISCOURSE, MEDIA PLURALISM AND THE THREAT OF DEEPENING THE CONFRONTATION

Abstract: *In the article Democratic Discourse, Media pluralism and the Threat of Deepening the Confrontation, the author focuses on both positive and negative aspects of media pluralism in the context of political pluralism; and, through comprehensive analysis of the post-Soviet media, illustrates preconditions of the problem and threats of deepening confrontation as a result of further process development. The article focuses on the impact of political parallelism, media agenda and framing on the political life that accompanies the depiction of the political agenda in the media. Furthermore, it shows how the media fosters the confrontational democracy first and then replaces it with accusatory democracy, which is preceded by a loss of public confidence in the political process, and which facilitates the emergence of a society of distrust. By explaining democratic discourse (the model of polarized pluralism), the author shows the desire of political elites to use media outlets as much as possible to entice the public in their favor, often encouraged by a lack of democracy and the ideology of political struggle. Taking into consideration the political and economic situations of the newly independent states, the article discusses threats and challenges that the post-Soviet and post-socialist countries face, and in the solution of which media is actively involved, but often political manipulation and instrumentalization compromise the state security. In the concluding part of the article, the author stresses out the categorical imperative of political choice - overcoming confrontation as a vital condition for the state security and media pluralism as one of the essential components of providing this security.*

Key words: *political pluralism, polarized pluralism, state security, media pluralism, political parallelism, media agenda.*

Language: *English*

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Introduction

Preface

The process of democratization started from the "top" in new independent states and it was not understood properly by the absolute majority of the society; at the same time, in the process of establishment of new world order, the transparency and accelerated pace of pluralism neglected many factors, which caused serious problems for these countries. Among these factors was media, which was inadequately explored as a mechanism to deepen confrontation and accordingly it, became a tool not only for internal political players, but also for foreign actors that took advantage of the current situation and began to use inner resources of the country to start hybrid war.

The high degree of politicization characteristic of democratic discourse dramatically increases the level of media politicization as well. In the conditions of polarized pluralism, due to political parallelism, not only the political process itself is damaged, but trust towards media is also substantially reduced or disappears completely. The instrumentalization of media in the struggle for power contributes to the strengthening of counter-democracy and the emergence of confrontation, which threatens the safety of the society and brings to the fore the problem of ensuring the national security, the solution of which is prevented by sharp political confrontation. This particularly damages the new independent states and the developing countries, because they find it difficult

to repulse the information storm and neutralize both internal and external threats.

Political parallelism on media agenda

The dismantling of the old political system in Georgia was completed by establishing the democratic state-political system. Totalitarianism has actually lost its legal and political ground. However, it is also clear that neither democratic political system and legal terms could function, nor a pluralistic environment could be established by themselves. Today their practical realization is a common political task and an issue of national security insurance. In this situation, free media and media pluralism, an integral part of political pluralism, acquire the greatest importance. A truly free media should be free from administrative pressure and censorship as well as from commercial dictation. Media should determine its content; though, this is often not the case and the polarized pluralism and, furthermore, unconcealed or hidden political parallelism are the reasons of this. However, Daniel C. Hallin and Paolo Mancini emphasize that even commercial media may be politically biased and, conversely, non-commercial media, supported by political parties, can develop norms to ensure political balance. (Hallin, Mancini, 2004, 32).

The media really wants to develop norms and ensure political balance, but one thing is a possibility and the other is a will. In this case, a will and a possibility do not coincide. The Georgian media is often under such political repressions that it cannot escape. This is accompanied by a commercial dictate that is lightened or, on the contrary, intensified according to political expediency. One of the reasons for this is the difficult social conditions, which, also, affects degree of affiliation. In this situation, it is vivid that the media "contributes to the obedience of the masses and also promotes political passivity... editors, journalists who, on the one hand, obey the "media-tycoons", and, on the other hand, they carry their interests because of personal views or benefits." (Kotrikadze, 2022, 269).

The political parallelism, media agenda and framing, that are subsequent aspects transferring political agenda into media, have a major impact on public mood. Even a superficial observation of today's Georgian media is enough to make sure that the political parallelism has a significant impact on the media systems, and this parallelism is so visible that there is nothing left to determine, and the media content is conspicuously “naked”. The influence of political pluralism and democratic discourse, with the instrumentalization of media pluralism, support the confrontation democracy, and, the next stage would be the democracy of blame. At this time, mutual accusations and the media's role as a prosecutor deprive it of its information content, and trust is lost in not only the political process and political players, but also in the media and journalists. As Mr. Zura Mkheidze, phycologist and communications specialist, declares, “information space terrorizes population” (Antadze, 2021, 491). In such situation, media avoids responsibility instead of being careful and not becoming a tool of sticking labels for mutual marginalization that is favorite behavior of politicians.

At this point, it is essential to focus on the media agenda, because the extent of manipulation of audience would become instantly obvious as soon as we observe the sequence and frequency of topics coverage. Renita Coleman briefly and precisely explains the formation of media agenda: „Agenda setting is the process of the mass media presenting certain issues frequently and prominently with the result that large segments of the public come to perceive those issues as more important than others. Simply put, the more coverage an issue receives, the more important it is to people.“ (Coleman, 2009, 147).

Even a superficial observation is enough to know which media serves to which political party or group's interests. TVs do not even hide that their agenda is in coincidence with a concrete political party’s agenda that totally excludes impartiality, complete reflection of processes and unbiased coverage of events. In this case, the mechanism of political bias is known and the goal of interpretation is clear. According to Robert Entman, unbalanced coverage of positions of political conflict parties confirms one-sided framing which is a part of the political agenda. “Slant occurs when a news report emphasizes one side’s prefereed frame in a political conflict while ignoring or derogating another side’s. One-sided framing emphasizes some elements and suppresses others in ways that encourage recipients to give attention and weight to the evaluative attributes that privilege the favored side’s interpretation.” (Entman, 2010, 389). The privileged politicians actively use this advantage granted from media and misinform the public; the latter has only a temporary effect, since the opposing side also has such a tool and therefore counters this disinformation with either the truth or with misinformation again that confuses the public even more. This process eventually destroys the positive attitudes towards freedom of speech and the benefits gained by this freedom.

Ms. Marina Muskhelishvili, talking about agenda, emphasizes a well-structured discourse: “An agenda relies on the consistent use of formation and framing and could be discussed as mythology – a virtual expanse of reality in space and time that has its own heroes and anti-heroes, symbols and narratives, perspective and dynamic reference points, and historical events. TVs have all the possibilities to create such a mythology.” (Muskhelishvili, 2015, 98). As the reason of bias, she names partiality of the journalist's subconscious worldview as well as external influences, and adds that consistent bias is the source of political influence. However,

Muskhelishvili does not talk about one more characteristic typical (not only) to the Georgian media: journalists change their taste and worldview not according to their political views, but concerning who their employer is at that moment. That is why you may often hear the answer: “Do I decide anything?” And this is said by the chief anchors and editors of TV programs. Ms. Muskhelishvili shares Robert Ertman's opinion that consistent bias framing of media communication is an indicator of content bias that sustains the success of specific interests, parties or ideologies. It should be noted once again that journalists have only roles of mechanical performers in this process, and the success or failure of these parties or ideologies means actually nothing to them.

Political Pluralism VS Polarized Pluralism

The polarized pluralism integrated in political parallelism is typical for Georgia, as well as for other post-socialist and, even more, for post-communist countries. Eastern Europe made some breakthroughs in this direction, however could not escape polarized pluralism, as the influence/impact of dictatorial and authoritarian regimes of the last century is still obvious. As for the post-Soviet space, Georgia has a certain advantage (Baltic countries are more Eastern Europe) compared to other former Soviet republics. However, psychologist Gaga Nizharadze critically analyzes this situation and states: "political experience and culture in Georgia is close to zero". (Antadze, 2021, 513). Irina Putkaradze, an active representative of the Georgian NGO-sector, does not share such a pessimistic approach: "Today Georgia has an opportunity to establish political and economic societal system that would be in coincidence with its cultural identity. This is a historic chance for Georgia to use unique intellectual and political potential characteristic to Georgian people” (Putkaradze, 2022, 73).

It is a fact that in Georgia we witness every model of polarized pluralism that Daniel Hallin and Paolo Mancini represent in the framework of general picture. In particular, this is high degree of politicization that supports the activation of political pluralism and the dominance of the state and political parties in most areas of social life increases confrontation, especially when the population is loyal to various political ideologies. This situation, on the light of over-ideologization, makes the absence of universally shared rules and norms even more visible. Hallin and Mancini also consider that polarized pluralism is as well characterized by uneven “consumption” of public information. For example, politically active citizens chase media agenda step by step, while politically passive citizens express even less interest towards political information. The authors emphasize another important circumstance. The news media is characterized by external pluralism and high political parallelism, the loyalty to ideologies contains a definite danger as it overweights the professional culture; consequently, we get close ties established between journalists and political players, active intervention of the state in the media sector, and focusing media content on tastes and demands of political activists. (Hallin, Mancini, 2004, 21-45).

It is also important for the media to take into consideration the level of public readiness. As in the case of Eastern Germany, the society accepted censorship-free press very hardly. Under totalitarian regime, people knew that any information published in press was censored, verified and confirmed, and, suddenly, these brakes were broken, and even now, 30 years of independence, you may hear that so much freedom is devastating. The processes of Perestroika and democratization put the issue of the media depoliticization on the public life agenda as one of the essential ones. The process was painful because the path from propaganda journalism towards democratic journalism turned out to be difficult. Therefore, promotion of new-formation journalists became a imminent part of the democracy promotion. Both media and public quickly realized that stagnation would lead journalism as profession to degeneration. According to Ms. Marina Muskhelishvili, “declared vector of transformation” was the turn-point from the propaganda journalism, which was tasked to influence the society, to the new journalism, which would serve interests of the society. The neutral, unbiased, evidence-based journalism was foreseen as ideal and dominant standard. The new game rules were supposed to ensure watershed between media and politics, but "this game rules and the content of the 'political' that it was intended to convey did not match." (Muskhelishvili, 2015, 110).

Here the weakness of political pluralism appeared, because the political establishment, as time went by, showed less readiness to impartially accept media pluralism as an essential factor contributing to healthy development of democratic processes. The political parallelism emerged, that was reflected in the mood of the electorate, and that Daniel Hellin and Paolo Mancini focus on, because "political parallelism is expressed in the biased media audience: supporters of different parties and trends buy newspapers or watch television channels according to their viewpoints." (Hallin, Mancini, 2015, 35). The political players more activated this process by promotion of counter-democracy. For the last ten years, the country has been living only in this mode, and the media consumers are completely alienated from each other as well as from the common sense. Here appears a sharp confrontation in the society and this is the major danger as it kills the opportunity to make a wise choice.

When discussing the polarized pluralism model and analysing the post-Soviet media systems, Ms. Marina Muskhelishvili pays attention to the observation of Daniel Hallin and Paolo Mancini and

recommends to take into consideration the fact that Georgia is a new independent country and the Soviet influence is following aspect that is expressed in the ideological thinking tradition as well. This means not only economic interests, but also that the politicization of journalists has solid foundation due to the Soviet past, and they being over-occupied by ideology may think that political propaganda is an integral part of their work. Here Ms. Marina Muskhelishvili emphasizes another and a very serious problem. Namely, the public may not perceive the information already provided to them in another form and may not be interested in this information at all. This logic leads Ms. Muskhelishvili to the conclusion that "the characters of the society and its institutions are closely linked; so, without taking this fact into account, the development of civil society institutions can be ineffective." (Muskhelishvili, 2006, 90).

We should also consider the fact that 30 years have passed since gaining the independence and many of the so-called Soviet journalists are no longer active in journalism. So, what is wrong with the today's Georgian journalism? If we look through the European or American media of recent years, we would be able to find the answer: here, also, the political processes have completely revealed media problems and presented the political parallelism in its worst forms. We may conclude that in 2020 – 2023 people saw the “true anatomy” of the world journalism and it would be completely inappropriate to say that only totalitarian regimes are characterized by a strong willingness to control the media. It became clear for everyone that any ideology would gladly pocket the entire media, or, failing that, part of media, at least, if it would have an opportunity. Particularly in circumstances when "In general, most of the so-called elite, primarily the political elite:

- Are fake and has not been able to elevate themselves to the level of our national essence; they are characterized by low-level political culture, alteration of party affiliations motivated by self-interest, ineptitude of judgment rather than rational and critical thinking, and contagious parasitic lifestyle. All of these classifications affect the entire country and impede democratic development.
- Are inflicted with the virus of selfishness, unable to liberate themselves from the harmful influence of a few destructive politicians and small groups. They affiliate themselves with these groups, which constantly gives way to accusations, false expectations, and imminent danger; together, they manage to polarize society, dividing it into two deficient parts-the elite and the rest.
- Are morally deprived, narrow-minded, and boring. And yet, they are immersed in their own ambitions and often stubbornly continue to preach to society while they wear the mask of a state caretaker, stained by their need for personal gain. Most tragically, they contribute to the aggravation of national resentment in the Georgian society. " (Khonelidze, 2021, 14).

Ms. Natia Kuprashvili's research is closely related to this viewpoint of Zurab Khonelidze that shows the results in the framework of the worst picture. Namely, if political actors have abandoned Georgia's political ideology and they need polarization to defeat the opponent in the power struggle, the manipulative media-content often presents opinions as facts. "The polarized media content tends to destroy and discredit the opponent; at the same time, this confrontation process is accompanied by a personality cult." (Kuprashvili, 2019). Accordingly, the researcher applied two terms to the Georgian political and media system, which is in the gray layer between liberal democracy and authoritarianism: polarized monism and/or polarized-defective pluralism.

This monism and defectiveness emerge a danger that both the political establishment and the media managers do nothing or almost nothing to avoid it. On the contrary, they try to gain some benefits by escalating the situation as much as possible. However, this is not really a public good, because the controversy damages both the political elite and the media, and, eventually, the whole society.

Conclusion

Now the categorical imperative of political choice is as follows: either political players will overcome the confrontation and give preference/advantage to the state interests and security, in which media pluralism will play a major role; or, they will be totally drown in the swamp of confrontation and completely mine the political field by using the media as a tool for deepening the confrontation; and, by deepening counter-democracy, they will blow up the mines and the political future will be destroyed forever, because the watershed, as a choice between good and bad, or bad and worse, will simply no longer exist: all against all will lead everyone to reject both politicians and journalists. At that time, the national security will already become an existential problem, that this generation will no longer be able to solve, because on their merits, political pluralism would turn out to be as much a fiction as media pluralism, which, eager to bring good to the society, splitting and confronted this society even more.

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Issue Article

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INFLUENCE OF WINTER SIDE CROPS ON YIELD AND SEED QUALITY OF POTATO VARIETIES

Abstract: *The purpose of the research is to study the influence of winter green manure crops on the growth, development, crop formation, yield and seed qualities of potato varieties, as well as elements of soil fertility and, on their basis, to select the best green manure crops and varieties that allow obtaining a sustainable high healthy yield of seed potatoes.*

In 2021-2023, research was carried out on old-irrigated medium-loamy typical gray soils with a groundwater depth of 7-8 m. The soils were characterized by favorable agrophysical properties and low content of humus, nitrate nitrogen, available phosphorus, and an average content of exchangeable potassium. We studied mid-early crops – Sante, Silvana and Bardoshli-3 on the following winter green manure crops – rapeseed, oilseed radish, peas (green pot), gray mustard and peas + oilseed radish. Winter plowing was used as a control.

An increase in the proportion of macro-aggregates by 12.9-26.1% in the arable soil layer, a decrease in micro-aggregates by 24.8-26.9%, a decrease in volumetric mass by 1.23-1.32 g/cm3, and an increase in water permeability by 70.8 were studied. -123.8 m3/ha, increase in humus content by 1.20-1.23%, nitrate- nitrogen - 12,38-33,56, available phosphorus - 31,37-43,25, exchangeable potassium - 310,7-326,2 mg/kg.

Plant development (the growing season extended to 4-8 days, height 66.4-80.7 cm; multi-stemmed 4.3-5.4 or more 1.1-1.6 pieces; powerful tops 404.4-495.3 d), the formation of productive, healthy (tuber yield 617.5-887.5 g, number of tubers - 6.7-11.2, average weight of one tuber - 76.2-90.2 grams) bushes and harvest, productivity (32.3-37.3 t/ha) and (marketable yield 25.4-36.8 t/ha, seed tuber yield 17.2-27.5 t/ha, multiplication factor within 5.7-8,6) with high seed qualities of various potato varieties.

Key words: *winter green manure crops, green fertilizers, biomass, growth and development, vegetation period, potato varieties, leaf surface area, productivity, yield of commodity and seed crops, reproduction coefficient, seed quality.*

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ВЛИЯНИЕ ОЗИМЫХ СИДЕРАТНЫХ КУЛЬТУР НА УРОЖАЙНОСТЬ И СЕМЕННЫЕ КАЧЕСТВА СОРТОВ КАРТОФЕЛЯ

Аннотация: *Цель исследований – изучение влияния озимых сидератных культур на рост, развитие, формирование урожая, урожайность и семенные качества сортов картофеля, а также элементов плодородия почвы и на их основе подбор лучших сидератов и сортов, позволяющие получить устойчивый высокий здоровый урожай семенного картофеля.*

В 2021-2023 годах проведены исследования на староорошаемых среднесуглинистых типичных сероземных почвах с залеганием грунтовых вод 7-8 м. Почвы характеризовались благоприятными агрофизическими свойствами и низким содержанием гумуса, нитратного азота, подвижного фосфора, средним содержанием обменного калия. Изучали среднеранние –Sante, Silvana и Бардошли-3 на следующих озимых сидератов – рапс, масличная редька, горох (зелёный горшек), горчица сизая и горох+масличная редька. В качестве контроля служил озимая вспашка.

Изучены повышение доли макроагрегатов на 12,9-26,1% в пахотном слое почвы, уменьшение микроагрегатов на 24,8-26,9%, снижение объёмной массы 1,23-1,32 г/см3, увеличение водопроницаемости на 70,8-123,8 м3/га, повышение содержания гумуса на 1,20-1,23%, нитратного азота - 12,38-33,56, подвижного фосфора - 31,37-43,25, обменного калия - 310,7-326,2 мг/кг.

Развитие растений (вегетационный период удлинялся до 4-8 дней, высотой 66,4-80,7 см; многостеблевую 4,3-5,4 или более 1,1-1,6 шт; мощную ботву 404,4-495,3 г), формирование продуктивных, здоровых (урожай клубней 617,5-887,5 г, количество клубней - 6,7-11,2, средняя масса одного клубня - 76,2-90,2 грамма) кустов и урожая, урожайность (32,3-37,3 т/га) и (товарная урожайность 25,4-36,8 т/га, урожай семенных клубней 17,2-27,5 т/га, коэффициент размножения в пределах 5,7-8,6) с высокими семенными качествами различных сортов картофеля.

***Ключевые слова**: озимых сидератных культур, биомасса, рост и развитие, вегетационный период, сорта картофеля, площадь листовой поверхности, продуктивность, выход товарного и семенного урожая, коэффициент размножения, семенные качества.*

Введение

УДК: 635.21:631.52:631.55:631.58

В мире в условиях растущего спроса на продукты питания в целях повышения урожайности сельскохозяйственных культур и качества продукции, обеспечивающей продовольственную безопасность, улучшающей плодородие почвы в системе севооборота при использовании сидератных культур (в качестве основных, покровных, промежуточных культур, кормов) требуется определение типов сидератных культур, соответствующих различным почвенным условиям, достижение высокой биомассы и семенного урожая, постоянное совершенствование агротехники применения её в качестве зелёных удобрений. Поэтому настоятельно требуется проведение исследований для установления сроков возделывания с целью достижения высокого урожая зелёной массы и семян, повышение плодородия почвы, урожайности картофеля, улучшение семенных качеств клубней.

Изучены влияние сидератных культур на плодородие почвы посевов, рост, развитие, зараженность растений сорняками, болезнями и урожайность хлопчатника, зерновых и других культур [1,2,3,4], а в картофелеводстве [5,6,7,8].

В применяемом в картофелеводстве краткосрочном севообороте сидератные культуры имеют большое значение для сохранения, повышения и защиты природного плодородия почвы, эти агротехнические меры, во-первых, обогащают почву питательными веществами, сохраняют и повышают естественное плодородие почвы, во-вторых, обладая аллелопатическими свойствами, оказывают положительное влияние на механические, водно-физические, агрофизические, агрохимические и микробиологические свойства почвы. Поэтому проведение исследований по использованию биомассы сидератных культур в качестве сидерации при возделывании картофеля в условиях староорошаемых типичных серозёмных почвы является актуальным.

Условия, материалы и методы исследований. Исследования проведены в условиях староорошаемых типичных сероземных почв фермерского хозяйства “Хисор” Яккабагского района Кашкадарьинской области в 2021-2023 годах. Механический состав почвы среднесуглинистый, с залеганием грунтовых вод 7-8 м. В опытном участке содержание гумуса в пахотном слое (0-30 см) почвы составило 1,19-0,084%, объемная масса - 1,28-1,34 г/см^3, а удельная масса - 2,6-2,9 г/см^3, общий азот - 0,095-0,094%, фосфор - 0,144-0,163%, калий - 2,6-2,9%, нитратного азота - 7,76-9,08 мг/кг, подвижного фосфора - 21-32 мг/кг и обменного калия - 279-298 мг/кг. В полученных данных установлено, что количество этих питательных веществ несколько меньше в подпочвенном слое почвы.

Объектами исследования выбраны староорошаемые типичные серозёмные почв, осенние рапс – сорта Немерчанский-2268; масличная редька – сорта Радуга; горох (зелёный горошек) – сорта Восток-55; сизая горчица – сорта Юбилейная, среднеранний сортов картофеля Sante, Silvana и Бардошли-3.

Для этих сортов картофеля изучали следующие сидератные культуры:

Варианты озимых сидератов (весенней сидерации): 1.Озимая вспашка (контроль); 2. Рапс - сорт Немерчанский-2268; 3. Масличная редька - сорт Радуга; 4. Горох - сорт Восток-55; 5. Горчица сизая - сорт Юбилейная; 6. Горох+масличная редька.

Площадь делянки по сидератам 354 м^2, а по сортам 14 м^2, повторность опыта четырехкратная. Посев сидератных культур проводили в осенью 19-21 октября, нормы высева: рапса - 12,0; гороха - 70; горчицы сизой - 8,0; масличной редьки - 16,0 кг/га, а при совмещенном посеве культур норму брали пополам. Удобрений вносили в норме $N_{30}P_{90}K_{45}$ кг/га. После посева озимых сидератов 3 раза - осенью и весной.

У озимых сидератных культур 65-70 (26.06-01.07) дней до посадки картофеля, определяли урожайность в период массового цветения, затем с помощью агрегата КИР-1,5М измельчали, дисковали и запахали на глубину 28-30 см. В опытах все учеты, анализы, наблюдения и мероприятия проводили на основе общепринятых методик и агрорекомендаций [9,10]. Статистическая обработка полученных данных осуществлялась при помощи программы Microsoft Excel и SPSS(Statustual Packagefor Soual Seeonce).

Результаты исследований.

Осенние сидератные культуры рапс, сизая горчица, масличная редька провели период зимнего покоя в фазе образования ботвы, горох - в фазе прорастания всходов, густота стояния растения на 1 м^2 озимых сидератных культур составила 474,1 у рапса, масличной редьки-482,5, гороха-199,0, сизой горчицы-479,0, гороха+масличной редьки-491,0 шт; высота растений-115,0 см у рапса, масличной редьки-123,8 см, гороха-207,6, сизой горчицы-219,6 см, гороха+масличной редьки-215,3 см (таб.1.)

Урожайность биомассы озимых сидератных культур составила 26,4-34,6 т/га по видам сидератов. Наибольший урожай биомассы составила 34,6 т/га при посеве масличной редьки, относительно высокий урожай биомассы (29,7-31,9 т/га) при смешивании гороха+масличной редьки и сизой горчицы отмечалась, что в чистом виде в качестве сидерата (таб.2.). При использовании биомассы озимых сидератов в качестве сидератных культур смеси гороха+масличной редьки >0,25 мм (0-30 см) составила 19,8-25,9%, или выше контрольного варианта на 8,2-13,0%. При посеве гороха, сизой горчицы в чистом виде составило 18,3-25,3%, что больше контрольной на 6,7-12,4%. После различных осенних сидератных культур были также изучены у среднеранние сорта картофеля Saviola, Silvana и Бардошли-3, в которых наблюдалось, что в период вегетации растений у сортов картофеля перед 1-м поливом при посеве гороха+масличной редьки в качестве сидерата было обеспечено в пахотном слое (0-20 и 20-30 см) объёмной массы 1,23 и 1,27 г/см^3, или её снижение по сравнению с контрольным (осенней вспашкой) на 0,05 и 0,07 г/см^3. При посеве гороха и сизой горчицы в чистом виде в качестве сидерата перед 1-м поливом у сортов картофеля в период роста в пахотном слое (0-20 и 20-30 см) выявлено снижение объёмной массы на 1,24 и 1,28 г/см^3, что ниже по сравнению с осенней вспашкой на 0,04 ва 0,06 г/см^3. При применении в качестве сидерата гороха+масличной редьки перед последним поливом в период роста в пахотном слое объёмная масса составила 1,24 и 1,28 г/см^3, что обеспечило наибольшее уменьшение на 0,06 и 0,07 г/см^3 по сравнению с контролем. В осенний период при посеве в качестве сидерата гороха и сизой горчицы в чистом виде по сортам картофеля перед последним поливом в пахотном слое объёмной массы 1,25 и 1,29 или выявлено снижение 0,05 и 0,06 г/см^3 га. Среди сидератных культур и посевов картофеля растения - паразиты не обнаружены. Отмечено, что они оказывают аллелопатический эффект на снижение прорастания семян сорняков в верхнем слое почвы при посеве в качестве сидератов рапса, масличной редьки, гороха, сизой горчицы в чистом виде и гороха+масличной редьки в смешанном виде.

Таблица 1. Рост и развития озимых сидератных культур

Т/р	Варианты	33-35 дней после всходов					Вегетационный период											
		25-28.11					28.02-3.03			20-22.03				28-31.03				
		высота растения, см	количество кустов растение на 1 м^2, шт.	количество стеблей, шт.	количество боковых ответвлений, шт.	длина корня, см	высота растения, см	количество кустов растение на 1 м^2, шт.	длина корня, см	высота растения, см	количество стеблей, шт.	количество боковых ответвлений, шт.	длина корня, см	высота растения, см	количество стеблей, шт.	количество боковых ответвлений, шт.	длина корня, см	количество кустов растение на 1 м^2, шт.
	2021 год																	
1.	Рапс	28	478	1	3,2	25	38	474	67	96,	1	7,7	97,	115	1	10,	140	474

		,8	,2			,5	,9	,0	,9	1			9	,6		4		,0
2.	Масличная редька	32 ,8	486 ,5	1	6	28 ,9	41 ,7	483 ,0	69 ,7	99, 1	1	16, 8	98, 5	125 ,0	1	25, 4	129 ,6	483 ,0
3.	Горох (зелёный горошек)	30 ,4	201 ,5	3,8	3,6	26 ,4	41 ,8	198 ,8	52 ,1	100 ,9	3,8	5,1	95, 0	212 ,0	3,8	7,8	112	198 ,8
4.	Горчица сизая	34 ,8	483 ,7	2	7,2	31 ,0	42 ,1	479 ,7	70 ,4	116 ,2	2	9,9	115 ,3	221 ,7	2	17, 2	144	479 ,7
5.	Горох+масличная редька	30 ,4	497 ,4	2,2 /1	3,4	21 ,0	33 ,0	494 ,5	43 ,2	100 ,3	2,2 /1	8,2	106 ,3	218 ,5	2,2 /1	17, 1	123	494 ,5
	2022 год																	
1.	Рапс	26 ,5	476 ,2	1	3,8	23 ,7	35 ,2	470 ,0	63 ,4	91, 6	1	6,3	102 ,3	112 ,4	1	8,4	139 ,3	470 ,0
2.	Масличная редька	30 ,5	481 ,5	1	6,1	27 ,0	35 ,3	475 ,6	66 ,8	88, 2	1	14, 4	98, 0	111 ,5	1	20, 9	120 ,3	475 ,6
3.	Горох (зелёный горошек)	28 ,4	200 ,1	4	4	24 ,8	33 ,1	195 ,7	49 ,5	101 ,5	4	4,4	95, 3	193 ,8	4	6,7	108 ,6	195 ,7
4.	Горчица сизая	29 ,7	472 ,5	2	7,4	30 ,9	35 ,2	467 ,4	66 ,4	112 ,3	2	8,8	115 ,8	210 ,3	2	14, 4	140 ,3	467 ,4
5.	Горох+масличная редька	26 ,7	482 ,4	2,7 /1	4,3	23 ,8	30 ,3	475 ,7	39 ,6	96, 6	2,7 /1	5,8	103 ,3	204 ,9	2,7 /1	12, 3	119 ,1	475 ,7
	2023 год																	
1.	Рапс	27 ,1	478 ,1	1	3,3	29 ,8	32 ,8	475 ,0	65 ,0	98, 3	1	8,0	104 ,0	117 ,0	1	11, 9	140 ,3	475 ,0
2.	Масличная редька	31 ,4	488 ,1	1	5,2	33 ,1	35 ,7	485 ,0	65 ,3	103 ,1	1	16, 6	101 ,3	135 ,0	1	25, 7	128	485 ,0
3.	Горох (зелёный горошек)	28 ,6	198 ,0	3,3	3,3	30 ,8	31 ,0	201 ,6	38 ,5	102 ,9	3,3	5,0	96, 1	217 ,0	3,3	7,0	110 ,5	201 ,6
4.	Горчица сизая	31 ,6	489 ,1	2	6,7	33 ,7	34 ,3	486 ,0	64 ,3	117 ,9	2	10, 5	117 ,2	226 ,8	2	16, 5	139 ,3	486 ,0
5.	Горох+масличная редька	28 ,5	501 ,0	1,7 /1	4	30 ,8	30 ,4	499 ,2	41 ,2	101 ,5	1,7 /1	8,5	104 ,0	222 ,5	1,7 /1	13, 4	118 ,6	499 ,2

Таблица 2. Урожайность биомассы осенних сидератов перед вспашкой

№	Виды сидератных культур	Урожайность сидератов по годам, т/га							
		2021		2022		2023		Средняя	
		Всего	из них надземная биомасса	Всего	из них надземная биомасса	Всего	из них надземная биомасса	Всего	из них надземная биомасса
1.	Рапс	28,5	25,7	27,5	23,8	28,6	24,9	27,6	24,8
2.	Масличная редька	35,3	31,8	33,7	28,5	34,8	30,6	34,6	30,3
3.	Горох (зелёный горошек)	27,6	24,4	25,1	20,7	26,5	22,7	26,4	22,6
4.	Сизая горчица	33,4	28,6	29,5	26,6	32,8	27,9	31,9	27,7
5.	Горох+масличная редька	31,8	27,8	24,8	27,8	29,6	26,6	29,7	26,4
	$S_{\bar{x}} = (\%)$	**1,12**		**1,29**		**1,51**			
	ЭКФ$_{0,5}$(т/га)=	**0,39**		**0,58**		**0,79**			

В осенний периоды смесь гороха+редьки масличной, горчицы сизой и гороха в качестве сидерата обеспечивала наибольшее содержание гумуса (1,20-1,23 или 0,01-0,03%) при посеве в чистом виде. Отношение C:N было благоприятным, когда сидератные культуры были посеяны смешанными, и гумификация растительной массы была увеличена. Наибольшая концентрация $N\text{-}NO_3$ (12,38-33,56 мг/кг) наблюдалась при посеве гороха в качестве сидерата, относительно большая при посеве гороха+масличной редьки - (12,35-31,54 мг/кг). Наибольшее накопление подвижного фосфора в почве (31,37-43,25 мг/кг) наблюдалось в осенний

периоды, когда рапс и сизая горчица были посеяны в чистом виде, горох+масличная горчица. Количество обменного калия доводили до максимального количества (310,7-326,2 мг/кг) при посеве рапса, сизой горчицы и гороха+масличной редьки в качестве сидератов.

Согласно полученным данным, всхожесть клубней сортов картофеля в озимых сидератах наблюдалась через 11-15 дней после посадки, а полевая всхожесть семенных клубней составила 99,2-99,9%. По сравнению с контрольным вариантом всходы семенного картофеля появились раньше на 3-4 дня, полевая всхожесть клубней -2,8-3,2%, бутонизация -1-4 дня, цветение - на 1-5 дней позже, вегетационный период увеличен до 4-8 дней.

При изучении озимых сидератов у сортов картофеля Sante, Silvana и Бардошли-3 по сравнению с контролем наивысшие показатели выявлены при посеве в качестве сидератов гороха - полевая всхожесть семенных клубней на 3,4-3,5% выше, всходы раньше на 4 дня, бутонизация и цветение удлинились на 3-5 дней, продолжительность вегетационного периода увеличилась на 7-8 дней. При применении в качестве сидератов смеси гороха+масличной редьки и горчицы сизой в чистом виде определены относительно высокая полевая всхожесть семенных клубней (99,6-99,8 или 3,4-3,5%), всходы (15 или 4 дня раньше), бутонизация (34 или дольше на 4 дня) и цветение (17-18 или дольше на 3-4 дня), продолжительность вегетационного периода (87-89 или дольше на 7 дней).

Исследования картофеля среднеранних сортов Sante, Silvana и Бардошли-3, изученных в озимых сидератах, показали, что рост, развитие и формирование органов роста (стеблей, листьев и боковых побегов) на 30-й день выращивания составили 37,6-46,5 или выше 2,9-7,6 см, период вегетации на 40-70-день составил от 48,5 до 80,7 или выше от 2,6 до 16,4 см. Самые высокорослые растения наблюдались после посева в качестве сидератов гороха в чистом виде - по сравнению с контрольным вариантом высота растений на 30-й день вегетационного периода составляет 45,8-46,5 или на 7,6 см выше, в последующие 40-70-й дни вегетационного периода больше, что каждые 10 дней периода вегетации 78,5-80,7 или на 14,4-15,7 см, после посева гороха+масличной редьки и гороха в чистом виде на 30-й день вегетации на 5,7-7,2 см, на 40-70-й дни вегетации 72,6-77,8 или 12,5-14,2 см. выше, чем сравнению с контроля (осенняя вспашка).

Наивысшее формирование с одного куста листьев, стеблей и боковых побегов у сортов картофеля Sante, Silvana и Бардошли-3, изученных на озимых сидератах, наблюдалось осенью при посеве гороха как сидерата в чистом виде, что по сравнению с контрольным вариантом на 40-й день вегетации составило с куста: листьев 140,6-145,6 или на больше 17,3-19,0; стеблей 4,5-4,6 или на 1,0-1,3; боковых побегов 3,3-3,6 или 1,1-1,2, то на 70-й день вегетации с куста количество листьев увеличивается на 217,8-242,6 или 42,6-53,7, а боковых побегов до 8,6-9,4 или 3,0-3,8 шт. При посеве в виде сидерата смеси гороха+масличной редьки и сизой горчицы в чистом виде на 40-й день вегетации по сортам по сравнению с контролем листьев с куста больше на 16,2-16,9 шт., стеблей 1,1-1,0; боковых побегов 0,9-1,2, в последующем на 50-70-й дни листья увеличились на 17,1-47,0; боковые побеги на 2,2-3,4.

Площадь листовой поверхности составила 70,6-71,6 тыс. $м^2$/га у среднеранних сортов картофеля Sante, Silvana и Бардошли-3осенью при посеве гороха в качестве сидерата. Отмечено, что при применении гороха в виде сидерата площадь листовой поверхности на 21,3-21,8 тыс. $м^2$/га выше контроля.

При изучении формирования урожая и продуктивности картофеля среднеранних сортов Sante, Silvana и Бардошли-3 после озимых сидератов продуктивность клубней с одного куста, количество клубней и средний вес одного клубня были самыми высокими при посеве гороха в качестве сидерата, что по сравнению с контролем на 60-й день вегетации урожай клубней с куста составил 399,3-336,3 или 131,0-63,6, средний вес одного клубня 76,7-74,7 или больше на 18,4-11,3 г, количество клубней 5,2-4,5 или больше на 0,6-0,2 шт., данные показатели увеличиваются на 70-80-й дни вегетации в соответствии с законом, в последний вегетационный период (на 90-й день) количество клубней увеличилось соответственно с куста: 643,8-652,3 или 250,1-203,6, 78,5-93,1 или 8,0-17,1 грамм, на 8,2-7,0 или 1,7-1,1 шт. После посева смеси гороха+масличной редьки и сизой горчицы в виде сидерата, что обеспечило по сравнению с контролем (зяблевая вспашка) у сортов картофеля испытанных на 60-й день урожая клубней, вегетации на одном кусте: урожай клубней 57,5-120 г, количество клубней составляет 0,2-0,7 г., при средней массе клубня более 11,3-14,1 г, эти показатели увеличиваются по закону через 70-80 дней, а в последний период роста (90-й день) с куста: урожайность клубней 617,6-627,1 или 223,9-178,4 грамма, количество клубней составляет 7,0-8,1 или 1,1-1,6 штук, при средней массе клубня 76,2-89,6 или 15,7-13,6 грамма больше.

Было отмечено, что урожайность картофеля среднеранних сортов Sante, Silvana и Бардошли-3, изученная в озимых сидератах, была самой высокой при использовании гороха в качестве сидерата, и урожайность составила 32,3-37,3 тонн с гектара или дополнительный урожай 8,8-9,1

тонн. Относительно высокие урожаи 30,7-36,6 т/га были получены при посеве смеси гороха+масличной редьки и сизой горчицы в чистом виде как сидерата и получена прибавка урожая на 5,8-8,4 т/га больше, чем в контроле (осенняя вспашка) (таблица 3).

Таблица 3. Влияние биомассы осенних сидератов на урожайность сортов картофеля (срок посадки: 26.06-01.07)

№	Наименование сидератных культур	Урожайность по годам, т/га			Средняя урожайность, т/га	По сравнению с контролем	
		2021	2022	2023		т/га	%
		Сорт Sante					
1	Контроль (осенняя вспашка)	23,4	22,5	24,6	23,5	-	100
2	Рапс	27,7	27,3	29,3	28,1	4,6	119,6
3	Масличная редька	26,9	26,4	27,4	26,9	3,4	114,5
4	Горох (зелёный горошек)	32,7	31,2	33,0	32,3	8,8	137,4
5	Горчица сизая	30,9	29,9	31,3	30,7	7,2	130,6
6	Горох+масличная редька	32,2	30,7	32,5	31,8	8,3	135,3
	$S_{\bar{x}}$ = (%)	**3,80**	**4,19**	**4,49**			
	НСР$_{0,5}$= (т/га)	**1,39**	**1,60**	**1,20**			
		Сорт Silvana					
1	Контроль (осенняя вспашка)	30,3	26,4	27,9	28,2	-	100,0
2	Рапс	33,4	33,9	34,3	33,8	5,6	119,8
3	Масличная редька	32,9	33,6	34,0	33,5	5,3	118,7
4	Горох (зелёный горошек)	35,4	37,5	39,2	37,3	9,1	132,2
5	Горчица сизая	34,6	36,5	37,0	36,0	7,8	127,5
6	Горох+масличная редька	35,0	37,2	37,7	36,6	8,4	129,7
	$S_{\bar{x}}$ = (%)	**2,21**	**2,75**	**2,85**			
	НСР$_{0,5}$= (т/га)	**0,75**	**0,91**	**0,96**			
		Сорт Бардошли-3					
1	Контроль (осенняя вспашка)	30,1	26,0	28,0	28,0	-	100,0
2	Рапс	31,9	32,3	33,0	32,4	4,4	115,7
3	Масличная редька	31,9	31,4	32,7	32,0	4,0	114,2
4	Горох (зелёный горошек)	35,6	36,0	36,6	36,0	8,0	128,5
5	Горчица сизая	33,0	33,6	34,8	33,8	5,8	120,7
6	Горох+масличная редька	33,2	34,6	35,4	34,4	6,4	122,8
	$S_{\bar{x}}$ = (%)	**2,57**	**3,28**	**4,21**			
	НСР$_{0,5}$= (т/га)	**0,87**	**1,12**	**1,37**			

Товарный урожай картофеля у сортов Sante, Silvana и Бардошли-3, изученных на озимых сидератах, составил 25,4-36,8 т или 94,5-98,9% от общей урожайности, семенной урожай 17,2-27,5 т/га или 67,6-74,8% от товарного урожая, а коэффициент размножения 5,7-8,6.

При использовании озимых сидератных культур у сортов картофеля отмечена положительная корреляционная зависимость высокой степени между урожайностью и площадью листовой поверхности **r=0,788(R^2=0,6256),** между урожайностью и средней массы одного клубня с куста - высокой степени **r=0,875(R^2=0,7686),** между товарной и семенной урожайностью (высокой степени **r=0,994(R^2= 0,9908)**.

ВЫВОДЫ

1. Установлено, что в условиях староорошаемых типичных серозёмных почв Кашкадарьинской области при возделывании рапса, масличной редьки, гороха и сизой горчицы в чистом виде, а также смеси гороха+редьки масличной в качестве сидератных культур в осенние периоды, урожайность биомассы с гектара составила весной 26,4-34,6 тонны. Наивысшая урожайность биомассы в оба периода получена в условиях посева масличной редьки в чистом виде и смеси гороха+масличной редьки.

2. Определено, что применение биомассы сидератных культур, в качестве зелёных удобрений улучшили плодородие почвы, особенно при возделывании в осенний период гороха, сизой горчицы, рапса в чистом виде и смеси гороха+масличной редьки, в пахотном слое

по сравнению с контрольным вариантом наблюдалось увеличение доли макроагрегатов на 12,9-26,1%, уменьшение микроагрегатов на 24,8-26,9%, водопроницаемость увеличилась на 70,8-123,8 $м^3$/га или больше на 14,8-25,89%, уменьшение объемной массы на 0,01-0,07 г/$см^3$, в результате чего содержание гумуса составило до 1,20-1,23 или больше 0,01-0,03%, валового азота, фосфора и калия, особенно нитратного азота до 12,38-33,56, а подвижного фосфора 31,37-43,25 и обменного калия 310,7-326,2 мг/кг почвы.

3. Установлено, что все сорта картофеля, испытанные после озимых сидератных культур, имели высокую полевую всхожесть семенных клубней, интенсивное появление всходов, рост и развитие, особенно при использовании в качестве сидератных культур гороха, сизой горчицы в чистом виде и смеси горох+масличной редьки отмечено повышение полевой всхожести семенных клубней на 2,7-3,5%, появление всходов раньше на 3-5 дней и увеличение вегетационного периода до 4-8 дней среднеранних сорта картофеля.

4. Выявлено, что при использовании сидератных культур рост и развитие среднеранних сортов картофеля происходит интенсивнее, чем у скороспелых, формирует высокорослую (высотой 66,4-80,7 или 6,3-15,8 см), многостеблевую (4,3-5,4 или более 1,0-1,6 шт.), мощную ботву (404,4-495,3 г) и корневую систему с широкой листовой поверхностью (69,6-71,6 или более 18,7-21,8 тыс. $м^2$). В результате продуктивность этих сортов составила 617,5-998,8 г с куста, количество клубней - 6,7-11,2, средняя масса одного клубня - 76,2-93,1 грамма.

5. Наибольшая урожайность (30,7-37,3 или 7,2-9,1 т/га дополнительно), из них товарная урожайность 30,3-36,8 т/га, урожай семенных клубней 20,5-27,5 т/га, коэффициент размножения в пределах 5,7-8,6 у среднеранних сортов картофеля Sante, Saviola и Бардошли-3 зафиксированы при использовании гороха, сизой горчицы и смеси гороха+масличной редьки в качестве озимых сидератных культур.

Рапс

Масличной редьки

Горчица сизая Смеси гороха+редьки масличной

Горох (зелёный горошек)

Рис. 1. Варианты: озимых сидератных культур.

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Issue Article

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IMPACT OF SOCIAL FACTORS ON SECURITY

Abstract*: This article examines the factors affecting safety and the degree of their influence. He also analyzes the general economic, regional, sectoral conditions, enterprise and workplace conditions in ensuring the safety of social factors. It consists of laws and other regulations governing labor relations with the influence of social factors on the economy as a whole. Territorially proportional provision and efficient use of labor resources in the region depends on the development of social infrastructure. On an industry-wide basis, this is reflected in the introduction of new modern methods and technologies. On the enterprise scale, it consists of socio-economic elements that ensure the use, development and restoration of the employee's working capacity. There is a classification of the action of the subject of labor directly at the workplace and his labor potential is manifested, therefore, when determining the factors of individual labor efficiency, psychophysiological potential, qualification potential and personal potential that express the labor potential of the employee are composed.*

Key words*: safety, economic security, laws, potential, efficiency, social factors, psychophysiological, economic factors, environmental factors.*

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Introduction

Improving efficiency by identifying the factors that affect labor efficiency in enterprises and studying the level of impact is an urgent task facing the science of labor economics today. Therefore, in order to better understand the scope and nature of the social factors that affect labor efficiency, we will study the factors in separate groups.

Human labor, which is manifested as a subject of labor in the production process of the enterprise, is a key element of the social factor affecting labor efficiency. Therefore, it is necessary to study labor potential as an important factor of labor efficiency.

The concept of labor potential is referred to in the economic literature as "... the physical and intellectual ability of an employee to perform the work assigned to him at a given time" [1], "... the quality of the total working capacity of the working population" [2] or society's potential considered. The formation of the essence of labor potential consists of the addition of components that represent quantitative assessment qualitative and efficient use.

Labor potential refers to an employee's level of qualification, knowledge, level, work experience, and capabilities [3]. Because people are different in nature, their labor potential is also different. It depends on several factors [4]. If one is too experienced, the other may be a highly qualified professional. While the third is someone with modern knowledge, the fourth category may be indifferent to themselves, the

community and society as a whole. Because of this, one person can create many material benefits or other labor out comes in a given unit of time, while the other can create more or less than the first person in that period. Hence, human labor potential determines their ability to be creative to varying degrees [5].

Methodology.

Human labor potential consists of 3 interrelated components: first, psychophysiological potential: ability, health, vigor, mobility, endurance, nervous system; secondly: qualification potential: to have special and labor-related knowledge and skills, to be able to apply them, to be able to change the quality of work; third: personal potential: civic position, ability to perceive the situation, to make the right and necessary decisions, organizational, creative approach.

Human labor potential is manifested as a social factor influencing labor efficiency in a highly developed period. However, it does not guarantee that labor efficiency can increase even if the worker's labor potential is high. It certainly depends on how the available potential is used in the production process. The more people's knowledge, skills and experience are applied, the higher the return on labor.

It is not possible to study the social factors influencing labor efficiency in a holistic system, because these factors may not result in increased conditions and the extent and level of efficiency as a result of the influence of a group of factors in the situation.

The analysis of social factors in groups on the scale of the impact on labor efficiency (Table 1), in our opinion, provides a broader understanding of these factors.

Table 1. Grouping of social factors influencing labor efficiency by scale of influence [6]

Scope of impact	Influencing factors
General economics	Labor law; Legal documents regulating labor relations.
Territorial	Availability of labor resources; Level of development of social infrastructure; Training and retraining.
Network	Introduction of modern techniques and technologies.
Enterprise	Working conditions; Professional development, certification, expectation of employment; Strengthening labor discipline; Socio-psychological environment; Management system and quality; Social orientation of production; Self-friendly communication between management and employees; Level of labor organization; Development of social infrastructure.
Workplace	Personal labor potential of the employee; Workplace organization.

The impact of social factors on the economy as a whole consists primarily of laws and other regulations governing labor relations in the country. On the other hand, the attitude to labor is a state policy aimed at increasing labor intensity, increasing the employment of labor resources.

Territorially, the proportional provision and efficient use of labor resources in the region depends on the development of social infrastructure. This includes labor migration, the development of social institutions, the availability of qualified personnel, their increase in quantity and quality, and the effective use of their labor [7].

In terms of the scale of the industry, it is reflected in the introduction of new modern techniques and technologies [8]. It is known that the introduction of modern technology in the industry will reduce human labor, increase the demand for qualified personnel, reduce the loss of factors of production, increase the quality and quantity of products and increase labor intensity.

On the scale of the enterprise, it consists of socio-economic elements that ensure the use, development and restoration of the working capacity of the worker. For example, the use of the psychophysiological potential of the worker is influenced by factors such as "working conditions", "level of labor organization" and "development of social infrastructure". The qualification potential of the employee develops due to the factor of "professional development, certification, promotion [9], [10]. "Factors such as "socio-psychological environment", "friendly relations", "labor discipline", "social orientation" also affect the attitude of workers to work, job satisfaction, personal potential and labor intensity.

The interaction of the labor force with the sources of production creates a workplace by ensuring that the worker is involved in the production process. In the workplace, there is a direct classification of the subject of labor and its labor potential, so in determining the factors of individual labor efficiency, it is important to study the social factors that affect the use and development of labor in 3 components. Factors of work efficiency in relation to the workplace: psychophysiological potential: working

conditions (sanitary-hygienic condition); labor intensity; workplace organization (color effects, lighting, air temperature); qualification potential: level of complexity of work, knowledge, work experience, special training (advanced training); personal potential: job satisfaction, creative opportunities, job satisfaction, attitude to work.

These social factors are directly and indirectly affecting labor efficiency and are complementary and interconnected.

We analyze the influencing social factors in terms of labor potential components.

Psychophysiological potential. A set of conditions that do not harm human health, comply with sanitary and hygienic rules, are safe, organized on the basis of labor standards, ensure the development of physical, mental and other capabilities in the workplace.

Working conditions. Meeting the sanitary requirements of the workplace and creating fair working conditions. Working conditions allow the effective use of mental and physical abilities from the factors of production (labor resources) while maintaining high working skills for a long time [11].

Studies of working conditions have shown that 35-55% of workers' temporary incapacity for work is caused by unfavorable working conditions in industrial production. Due to unfavorable working conditions in the workplace alone, every year on average in the country more than a thousand workers become disabled as a result of occupational diseases.

Workplace organization (color effects, lighting, air temperature). The state of conditions and facilities created in the production process for normal functioning, based on the psychophysiological characteristics of man.

Socio-cultural and aesthetic perceptions of colors by people reflect a state of psychological influence. The nature (composition) of color is important in the impact of colors on human psychology, and it is also important in its pure, bright, formal, material appearance, and in its location.

Analysis and results.

In order to study the effect of colors on the work of workers, our observations and research conducted in 2015 at the limited liability company "Karshi Repair Plant", which specializes in the production of high value-added products in industry, awarded the international certificate of quality management ISO 9001: 2008. opportunities to reduce the negative impact and increase labor efficiency through their use have been identified. Painting buildings and equipment with blue and blue colors in production processes under the influence of high temperatures and noise gives good results, less used in the production of red and yellow colors, these colors increase human labor for a short time and then quickly exhaust, constantly busy posters related to the production process in the workers' shop (intensive labor activity, finished products, the results achieved by the enterprise, safety rules) have been found in our experiments to improve the mental state of workers at work.

Illumination of enterprise rooms, workshops and areas plays a special role in improving the normal working conditions in enterprises. Workers working in poorly lit buildings (rooms) may not like the objects and tools around them, may not be able to adapt to the production conditions, too bright light can cause blindness, which leads to additional strain on the eyes, which can lead to accidents. can be. Proper and planned lighting allows workers to increase their working capacity, production volume and quality, as well as create safe working conditions [12].

Various technological equipment and processed materials in manufacturing enterprises, heat rays radiating from the surface of the substance affect the increase (heating) of air temperature. An increase or decrease in air temperature (cooling) has a huge impact on a person’s ability to work and health. As a result of our research, it was found that when the air temperature in the production process is 26-300 degrees Celsius, the working capacity of workers is 30-50 percent of normal air temperature, and at 180 degrees Celsius - 62-65 percent. An increase in air temperature causes the human body to heat up, increase the heart rate and cause the body to sweat. This has the effect of reducing a person’s physical and ability to work.

Qualification potential. The ability of a busy employee to perform work of varying complexity efficiently and qualitatively, using his work experience and knowledge. The increase in skill potential depends on the employee’s ability to work effectively in complex jobs. Therefore, in addition to reforming forms of ownership and management, remuneration of labor and the whole distribution policy, the promotion of employee labor, active and more productive work, stable in conditions of sufficiently high professional skills, general cultural and technical level and self-sufficiency can be.

Personal potential. The ability to develop and effectively use one's inner potential. The ability of a person with personal potential to live well, to succeed in life, and to find an effective way out of various difficulties. This potential includes internal culture and interest, responsibility, respect for people, self-confidence, a positive attitude to work, self-sacrifice, a strong desire for knowledge and purpose, or in other words, the socio-psychological state of the individual [13].

These workplace-related factors are related to human perception and performance as factors that subjectively affect work efficiency. This, of course, has a strong and mutually beneficial effect on increasing labor efficiency by interacting closely with other objective factors. It should be noted that the

extent to which workplace-related factors affect efficiency may or may not be significant, which of course depends on the level of use of human perception and activity.

Conclusions.

In conclusion, it should be noted that the study of social factors influencing changes in labor efficiency in groups across the economy, region, industry, enterprise and workplace: first, the separation of factors affecting collective and individual labor efficiency; second, the creation of a system of social indicators of labor efficiency; third, the development of sources of information and methods of its analysis; fourth, it allows to reduce labor costs in the product structure.

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Issue Article

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MECHANICAL PROPERTIES OF POROUS MATERIAL BASED ON TRIPLY PERIODIC SURFACES OBTAINED FROM THE ATOMIC NETWORK OF SODALITE

Abstract: *Mechanical properties of porous material based on triply periodic surface are explored experimentally and theoretically. The triply periodic surfaces (TPS) are obtained by new method on the basis of a topological network representation of the crystal structures of chemical compounds. A model of a porous material based on the crystalline structure of sodalite has been created, samples of the material are manufactured using 3D printing, their mechanical properties are studied using computer-aided design and measured experimentally. The simulation results are in good agreement with the experiment and previous works on schwarzide-p.*

Key words: *triply periodic surfaces, additive manufacturing, scaffold material, compression stiffness, compression modulus, Mises stress, Gibson-Ashby model.*

Language: *English*

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Introduction

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Modern technologies widely use materials with porous structure of various types and dimensions [1]. An important group of such materials, which attracted attention in the last years, is based on smooth triply periodic surfaces (TPS) with diverse topological and geometrical structure [2, 3]. The interest to these materials is primarily caused by their thermal-conductive, electrical-conductive, acoustic, and vibration-isolating properties [4, 5], as well as by their ability to adsorb strain energy [6-11]. Filling pores with the materials to be different from the skeleton base material enables one to fabricate new composite materials and metamaterials with wide range and considerable anisotropy of physical properties. The mentioned features together with the Additive Manufacturing (AM) technology make the TPS materials an indispensable part of modern engineering solutions and thus are a subject of intense theoretical and experimental studies.

As is known, the number of TPS currently used in the development of porous materials is very limited, and the task of creating new TPS is an urgent scientific task [12]. In this article, we test a new method for obtaining porous materials based on TPS, based on a topological network representation of the crystal structures of chemical compounds, in particular zeolites [13, 14]. The theoretical foundations of this method are described in detail in [15]. This approach makes it possible to generate an unlimited number of TPSs and corresponding porous materials using the ToposPro software package [16]. After a certain thickness is given to the surface, it can be printed as a part by additive manufacturing, and its physical properties can be investigated using a computer-aided engineering (CAE) systems, such as the ANSYS software [17], and studied experimentally. As an example, we generated a model of a porous material from the crystal structure of a zeolite-type sodalite and produced 3D-printed samples of various shapes and sizes from a styrene butadiene copolymer (SBS). We measured the mechanical characteristics of cylindrical porous SBS samples and found that they perfectly match the parameters modeled using the ANSYS software.

The structure of the article is as follows. Section 2 describes experimental measurement of mechanical properties of porous structure. In Section 3 the numerical modeling of mechanical properties and comparison of the results with experimental data is produced. In conclusion, the main results of the work done are summarized.

2. Experimental investigation of mechanical properties of SOD-based TPS-based porous structures

To study the mechanical properties of a SOD-based material porous right circular cylinders with a diameter of 30 mm and a height of 60 mm were manufactured by SBS 3D printing. The cylinders consisted of elementary SOD-based RVEs with wall thickness of 0.2 mm, which can be inscribed in cubes with edges of 8.89 mm. Each cylinder was based on a layer of 36 RVEs joined in a horizontal plane, and there were 12 such layers in the cylinder (Fig. 1).

Figure 1. Sample of SOD-based TPS-based porous structure manufactured by 3D printing FDM technology.

Mechanical properties of the samples manufactured from SBS significantly depend on the 3D printing mode, in particular, on the fiber-laying direction. In this regard, before studying porous samples, it is necessary to experimentally measure the mechanical characteristics of the SBS material after passing through the 3D printer. For this purpose, several solid cylinders of the above-mentioned dimensions were manufactured on the same printer using the same technology.

Measurement of the mechanical characteristics of all samples was carried out on a SHIMADZU tensile testing machine, which allows recording measurement results in an automatic mode. Compression of samples was performed at a rate of 1 mm/min. The error of all measurements did not exceed 0.01%.

The experimental stress-strain curve averaged for all solid examples (Fig. 2) revealed linear increase of strain at low stress and plastic strain area up to the stress of 17,4 MPa. This behavior is typical for such materials [18].

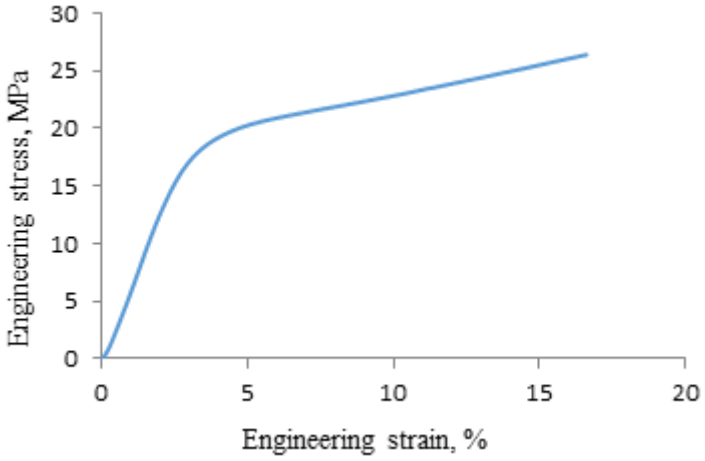
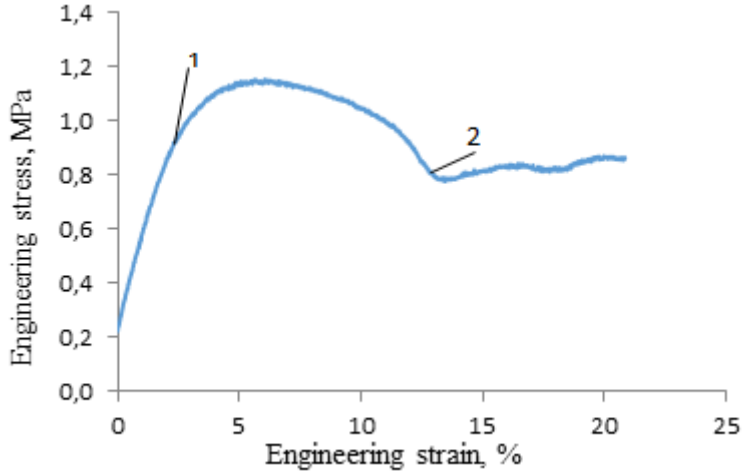


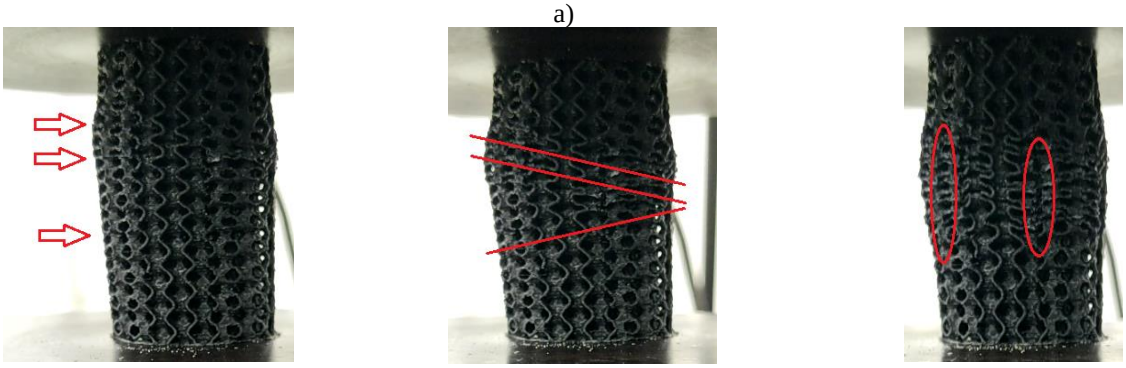
Figure 2. Averaged experimental stress-strain curve during compression of solid cylinders manufactured from SBS by the FDM technology.

Further the so-called cold flow was observed, i.e. the growth of strain occured at a slightly increasing stress up to 26 MPa. This region is characterized by the absence of a yield point, which apparently indicates a change in the supramolecular structure of the polymer. Using the experimental data presented in Fig. 11 we estimated the mean value of the elastic compression modulus as E = 625.6 MPa in the range ε= 1 – 3%. The obtained value is within the allowable range of this modulus for the SBS polymer at room temperature.

Porous samples (Fig. 1) were studied using the same experimental technique as solid samples. The averaged experimental loading curve (Fig. 3a) revealed three stages that the porous samples passed through before being compressed into a solid disk. The first area (ε=0–1%) is linear with a gradual predominance of plastic strain over elastic strain, while slip planes are gradually formed on the sample (Fig. 3b). This behavior of the sample is preserved up to $\varepsilon\approx$3%. The second part of the curve (ε=1–2%) contains a maximum, which is apparently caused by the strain of the RVEs along the slip planes (Fig. 3c)).



a)



b) c) d)

Figure 3. a) is averaged loading curve of the porous samples; b) is the first (elastic) stage of strain (ε=0–1%), c) is the second stage of strain (diagonal slip area, ε=1–2%), d) is the third stage of strain (second yield area, ε=2%–failure). The arrows indicate the emerging slip planes.

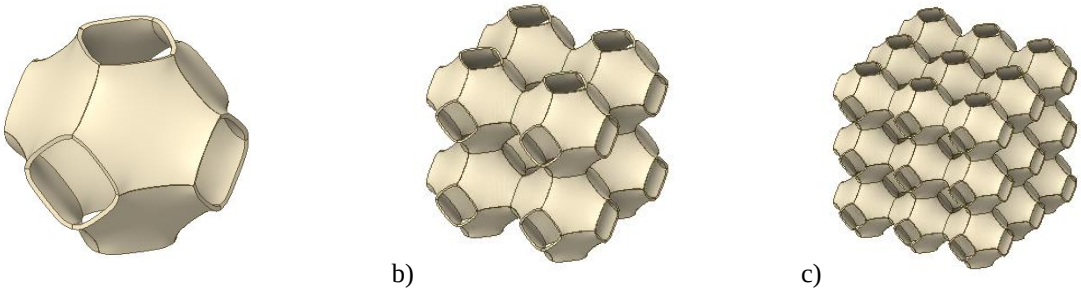
In the third part (Fig. 3d) longitudinal cracks were formed in the volume of the samples under tensile stresses perpendicular to the compress direction. All three stages of the sample compression are characterized by the lack of symmetry in the formation of slip planes and their further propagation, in crack formation, as well as in compression of RVEs. Apparently, these features are the consequences of the anisotropy that is caused by the selected 3D printing mode, as well as by the printing quality. Note that the resulting loading curve (Fig. 3a) is quite typical for porous materials based on three-periodic surfaces [1].

The elastic compression modulus E_c was determined by averaging the values of the curve slope within ε=1–2% (Fig. 3a):

$$E_c = (22.41\pm2.23)\ \text{MPa} \quad (1)$$

3. Theoretical investigation of mechanical properties of SOD-based TPS-based porous structures

The finite element method implemented in the ANSYS was used for the computer modelling of the experimental on measurement of the elastic properties of porous samples, as well as for predicting their mechanical properties when changing their size, shape and the RVE thickness. At the first step, we selected the most suitable model for describing the nonlinear mechanical properties of the material. According to its mechanical properties, the SBS polymer belongs to the class of hard rubbers, i.e., the Poisson ratio of this material is close to 0.5. Such rubber-like materials are generally considered to be hyperelastic and can experience large elastic and viscoplastic strains. To simulate the mechanical properties of samples made from such materials Green's model of hyperelastic material is used as a rule [19].



a) b) c)

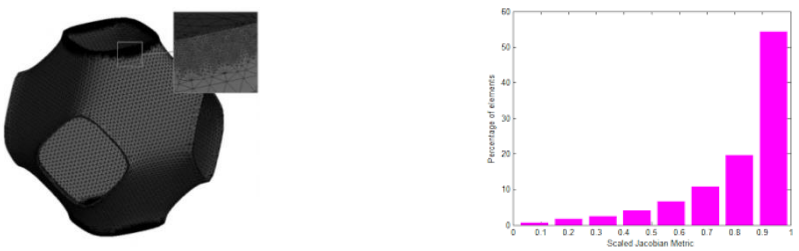
Figure 4. Objects with 1 a), 8 b) and 27 c) SOD-based unit cells, for which the calculations of the modulus of elastic compression and the shear modulus were performed.

Calculations of the mechanical properties of porous samples in this model require analytical fitting of the experimental loading curve for solid cylinders (Fig. 2). We performed such fitting in ANSYS using the Yeoh model [20]. In these frameworks the mechanical properties of simple objects with the number of RVEs 1, 8 and 27 (Fig. 4) were first modeled. The values of corresponding elastic constants for a given RVEs are presented Table 1.

Table 1. Modulus of elastic compression E_c and shear modulus G for porous objects with different number of RVE and thickness of walls (Fig. 4).

Number of RVEs in layers length	Thickness of walls, mm		
	0.06	0.08	0.20
	E_c, MPa	E_c, MPa	E_c, MPa
1	1.13	1.51	2.01
2	2.26	3.02	3.78
3	3.39	4.53	4.38

The finite element model was constructed using the patch-controlled method, with additive mesh for in-depth detailing of stresses at the places of application of the load and sealing of a geometric object. All finite elements were linear tetrahedral elements with reduced integration; type SOLID 185, according to the ANSYS labeling scheme (Fig. 5a). Quality of mesh confirmed by Jacobian of constructed finite element model (Fig. 5b).



a) b)

Figure 5. Finite element model of SOD-based material. a) show the details of the place of application of the load, b) is the Jacobi matrix of the resulting finite element model.

Constructed finite element model was solved using Dirichlet boundary conditions:

$$\Delta\varphi(u_1) = 0, \quad \forall u_1 \in \Omega, \tag{2}$$

$$\varphi(u_1) = f(u_1), \quad \forall u_1 \in \partial\Omega, \tag{3}$$

where φ is the unknown function, u_1 is the independent displacement (e.g. the spatial coordinates), Ω is the function domain, ∂Ω is the boundary of the domain, and f is a given scalar function defined on ∂Ω (Fig. 6).

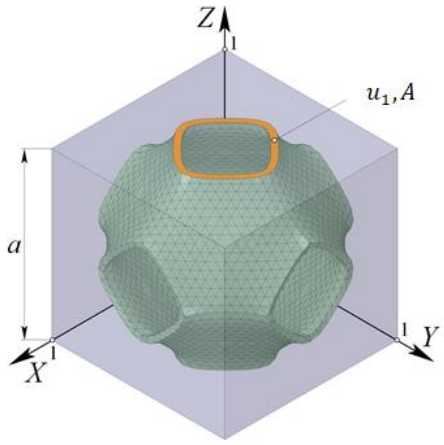


Figure 6. RVE-scheme of boundary condition of SOD-based surface.

The values of the compression module were obtained using well-known dependencies:

$$E_c = \frac{\sigma}{\varepsilon_c}, \tag{4}$$

$$\sigma = \frac{F}{A} \tag{5}$$

$$\varepsilon_c = \frac{a - a_c}{a}\,100\% \tag{6}$$

where E_c is compression modulus, σ is compression stress, ε_c is compression strain, F is force acting on surface, A is area of surface, a is initial length, a_c is compressed length.

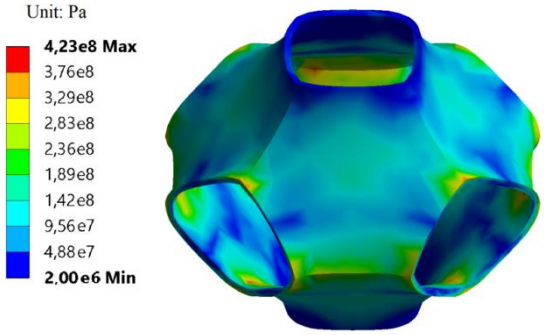


Figure 7. Von Mises stress distribution under compression in a SOD-based RVE sample.

The von Mises stress distribution (Fig. 7) is quite uniform and slightly varies close to 142 MPa. Such a uniform distribution is typical for triply periodic minimal surfaces [21], which equivalent to our SOD-based surface. The high uniformity of stress distribution in our porous sample confirms that the smoothing procedure described in Section 2 includes the condition and, hence, results in a minimal mean curvature of the surface, or in the limit to zero mean curvature, i.e. to a minimal surface. However, in the sample in Fig. 7 there are small border areas where the stress differs significantly from the average value and reaches 423 MPa.

Note that the direct calculation of the mechanical properties of samples with a large number of RBEs and, in particular, the experimentally studied 3D printed cylinder (Fig. 3) is resource-consuming due to the topological and geometric complexity of the object. In this regard, we say that the dependence of the compression modulus in Table 2 on the number of horizontal layers in the sample is close to linear. We performed a rough linear extrapolation over three points and calculated a confidence interval with a confidence probability of 0.7 for the compression modulus at the number of layers equal to 12, i.e. at the number of layers in the cylinder. The experimental value of the compression modulus (4) for the cylinder is within the obtained confidence interval.

Our calculations are compared with calculations of the mechanical characteristics of porous structures

performed in other works. For this purpose, the results for the elastic modulus presented in Table 2 were converted in a function of the average density of the porous structure. The thus obtained function was placed on the Ashby diagram (Fig. 8). The diagram shows for comparison the results for other porous structures from Ref. [21].

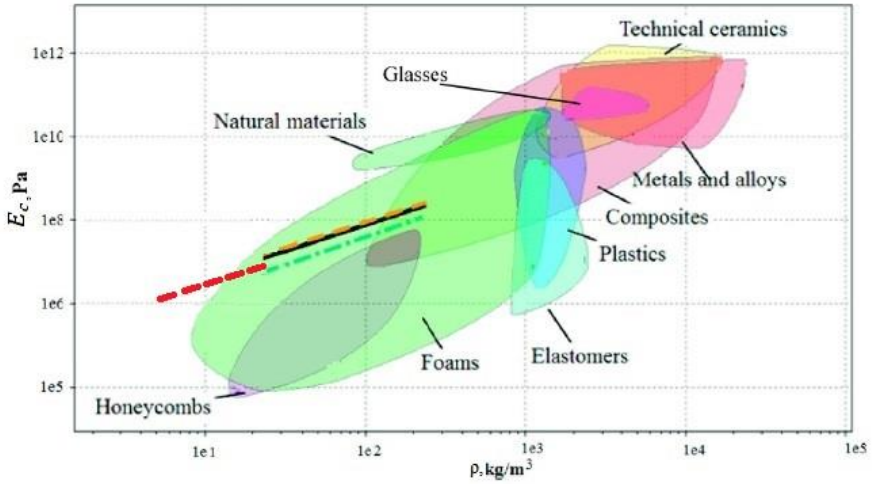


Figure 8. Ashby diagram with porous materials [21]. Black solid, yellow dashed and green dashed-dotted lines correspond to Neovius, IWP and P surfaces; dashed red line is the results of our study for the SOD-based surface.

The dependence of E_c on the average density of our porous structures (Fig. 8) is linear as for porous materials studied by other authors [21] including the ideal *P* surface, and follows these dependencies. An insignificant difference in the dependencies is apparently caused by the difference in the materials, from which the porous structures were fabricated, as well as in the selected 3D printing mode.

Conclusion

A porous structure was generated from sodalite crystal by new method on the basis of a topological network representation of the crystal structures of chemical compounds. Samples of this material were manufactured by 3D printing from SBS filament, and investigation of their thermal and mechanical properties was conducted. Experimental studies of samples obtained by 3D printing were carried out in the work in order to verify theoretical models. A very good agreement between theoretical calculations and experiment was obtained.

Experimental measurements of mechanical properties for porous samples in the form of right circular cylinders were made. Experimental loading curve was obtained, and compression modulus for these porous objects was measured. Loading curve was obtained and elastic compression modulus for these porous objects was measured in experiments.

Numerical modeling of mechanical properties for porous objects was performed. We calculated elastic compression modulus for various relative densities of the porous samples. The results for compression modulus thus obtained fall on Ashby diagram very close to the respective results obtained for porous structures in other studies.

So, the results obtained in the present paper give opportunity to state high efficiency and great opportunities of the suggested approach to generation of new porous materials as well as in theoretical and experimental studies of their mechanical properties.

Acknowledgement

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Issue Article

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METHODOLOGICAL FOUNDATIONS OF TEACHING THE SUBJECT OF ASTROPHYSICS BASED ON AN INTEGRATIVE APPROACH

Abstract: *This article discusses the methodological foundations of teaching astrophysics in higher pedagogical educational institutions with an integrative approach. Also, methodological recommendations for teaching astrophysics with an integrative approach and interdisciplinary integration are given.*

Key words: *higher pedagogical universities, astrophysics, astronomy, natural sciences, medicine, electromagnetism, geophysics, biology, integrative approach, cosmonautics, mathematics.*

Language: *Russian*

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Scopus ASCC: *3304.*

МЕТОДИЧЕСКИЕ ОСНОВЫ ПРЕПОДАВАНИЯ ПРЕДМЕТА АСРТОФИЗИКА НА ОСНОВЕ ИНТЕГРАТИВНОГО ПОДХОДА

Аннотация: *В данной статье рассматриваются методологические основы преподавания астрофизики в высших педагогических учебных заведениях с интегративным подходом. Также, дано методические рекомендации преподавания астрофизики с интегративным подходом и межпредметной интеграции.*

Ключевые слова: *высшие педагогические вузы, астрофизика, астрономия, естественные науки, медицина, электромагнетизм, геофизика, биология, интегративный подход, космонавтика, математика.*

Введение

В последние годы в образовательных учреждениях нашей страны проводятся системные реформы по преподаванию всех предметов в соответствии с современными требованиями. Это, в свою очередь, неразрывно связано с последовательным повышением значимости образования и знаний в жизни общества. Эти вопросы касаются и проблем преподавания «Астрофизики», которая является составной частью «Астрономии». В современных исследованиях признается, что «астрофизика» напрямую интегрируется не только с естественными науками, но и социальными и гуманитарными науками.

Современный пост неклассический этап развития науки демонстрирует характерную черту интерактивности, становится все более междисциплинарным и кооперативным в решении научных проблем. Хотя наука «астрофизика» создавалась на основе взаимной интеграции и синтеза наук физики и астрономии, сегодня эта наука связана не только с естественными науками (химией, биологией и др.), но и с социальными и астрономическими. гуманитарные науки (философия, история, экономика, медицина, психология и др.) образуют прочные связи. В частности, знание астрофизических явлений несомненно необходимо в той или иной степени в жизни каждого человека. Именно поэтому наука «Астрофизика» стала важным учебным предметом системы высшего педагогического образования, приобретает все большее значение

в развитии научных знаний человечества о Вселенной и их практическом использовании.

Наука астрофизика, как одно из основных и главных направлений астрономии, стала важнейшей составляющей науки о Вселенной. В настоящее время существует необходимость повышения эффективности преподавания данного предмета в высших педагогических учебных заведениях. Основная причина этого заключается в том, что этот предмет, как относительно новый предмет, теперь включен в учебную программу.

Это, в свою очередь, создает различные научно-методические проблемы и сложности в преподавании данного предмета. На наш взгляд, для решения этих проблем целесообразно использовать «интегративный подход», который в настоящее время признан одним из наиболее эффективных подходов в процессах преподавания предметов. Поскольку наука «Астрофизика» имеет интегративный характер с точки зрения своего зарождения, необходимо отдавать приоритет этому аспекту в процессах ее преподавания [9, с.63].

Основная часть

В качестве методических основ преподавания астрофизики на основе интегративных подходов мы считаем важными следующие аспекты:

Аспект 1: Астрофизика как наука:

- интеграция физики и астрономии, характеризующая возникновение астрофизики как науки;
- Интеграция астрофизики с другими науками (междисциплинарная интеграция);

Аспект 2: Астрофизика как учебный предмет:

- Межпредметная интеграция в преподавании астрофизики;
- Междисциплинарная интеграция в преподавании астрофизики;
- Интеграция между видами обучения в преподавании астрофизики;

1. Астрофизика как наука. Астрофизика как наука возникла в результате взаимной интеграции астрономии и физики. Позднее увеличение масштабов и объемов астрофизических исследований привело к их интеграции с другими областями. Например, приложение знаний геофизики, объясняющей физические процессы, происходящие в разных слоях Земли, к познанию физических процессов на Солнце создало новые знания о Солнце [6, с.1356-1357].

Необходимость совершенствования астрофизических измерительных приборов, в свою очередь, сблизила области астрофизики и материаловедения. Также знание материаловедения имеет большое значение при создании космических ракет и спутников. При этом инженерные технологии эффективно использовались при технологическом проектировании космических ракет и спутников, а информационные технологии эффективно применялись для реализации коммуникационной и управленческой деятельности.

Космонавты играют важную роль в запуске спутников в космос и исследовании некоторых астрофизических объектов. Естественно, в таких условиях возникла потребность в медицинских науках, а вопросы сохранения здоровья людей в космическом пространстве и обеспечения их нормальной жизнедеятельности потребовали интеграции астрофизики и медицинских наук. Именно эти требования и развитие интеграции на основе этих требований впоследствии создали основу для возникновения области космической биологии, которая в настоящее время быстро развивается.

Естественно, небесные тела, особенно солнечные лучи, оказывают на Землю различное воздействие. Именно в результате изучения влияния Солнца на биологические организмы на Земле была создана область гелиобиологии, которая в настоящее время быстро развивается на основе интеграции астрофизических знаний. То есть во многих исследованиях изучалось влияние солнечной активности на человека и другие биологические организмы на Земле [4, с. 425].

В частности, тонус жизни людей на Земле в определенном смысле снижается в минимальный период солнечной активности и повышается в периоды активности. При этом зарождение и развитие различных заболеваний происходит у людей именно в период деятельности. Также изменения активности Солнца могут серьёзно В результате могут произойти изменения в экономике всей Земной системы. Принимая во внимание другие влияния, можно сказать, что экономический кризис, произошедший во всем мире в 2008 году, также в определенном смысле связан с минимальным периодом солнечной активности.

2. Астрофизика как учебный предмет. На наш взгляд, одним из главных условий интеграции учебных предметов является выявление общего между ними, понимание природы взаимосвязей, объяснение «цепочек» в системе причина-следствие в логической последовательности. Мы считаем, что астрофизику следует рассматривать как горизонтальную междисциплинарную интеграцию базового блока предметов, преподаваемых в педагогических вузах.

Потому что знания, полученные студентами по механике, молекулярной физике и термодинамике, электромагнетизму, оптике, атомной, ядерной физике и физике элементарных частиц, теоретической физике служат фундаментальной основой для освоения науки астрофизики.

По этой причине, когда мы изучаем астрофизические объекты в целом, мы обращаемся ко всем вышеперечисленным наукам. Итак, горизонтальную интеграцию учебного предмета астрофизики можно увидеть в выражении природы астрофизических объектов через аспекты, связанные с указанными науками. Например, любое небесное тело выражается через механические, молекулярно-физические и термодинамические, электромагнитные, оптические и другие характеристики [7, с. 21-22].

При этом сами учебные предметы должны строиться на основе общетеоретической концепции. В частности, одной из основных проблем, стоящих перед нами при интеграции учебных материалов по «Астрофизике» и другим естественным наукам, таким как «Физика», «Химия», «Биология», является вопрос структурирования содержания на основе разных подходов. В частности, при изучении астрофизических явлений одновременно используются все физические теории и законы.

В этой ситуации учебные материалы курса физики, астрофизические знания объединяются вокруг основных понятий: «движение», «материя», «поле», «энергия», соответствующих разделов физики «Механика», «Молекулярная физика», «Электродинамика». «Оптика», «Физика атомов, ядер и элементарных частиц», «Теоретическая физика» и др. При этом основными случаями являются движение всех тел и движение небесных тел в классической механике.

Основные идеи электродинамики Максвелла отражены в радиоволнах, видимом свете, инфракрасном, ультрафиолетовом и рентгеновском лучах, а законы ядерной физики объясняют ядерную энергию и механизмы радиационной энергии Солнца и звезд. Структурирование этих различных подходов в учебных материалах основано на применении общих принципов, применяемых к астрофизическим проблемам. Это основано на следующих трех основных понятиях: «планета», «звезда» и «вселенная». С целью развития знаний об этих понятиях астрофизики в сознании учащихся обобщаются материалы курса физики в общеобразовательных школах, также материалы, относящиеся к различным разделам курса «Общая физика» в педагогических вузах. Эти обобщения вкладывается в основные идеи и формируются в программах высшего образования по науке «Астрофизика» [5, с. 301].

Заключение

Обеспечение интеграции физики и астрономии в современных достижений считается одним из основных направлений научно-технического развития космонавтики и решения современных глобальных проблем. Это напрямую расширяет возможности гуманизации процессов преподавания астрофизики.

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Issue Article

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INTERSUBJECTIVE INTEGRATION – SEARCHING FOR NEW PEDAGOGICAL DECISIONS

Abstract: *This article describes the use of new advanced pedagogical technologies in teaching astronomy. The introduction of new individual, advanced and pedagogical technologies into the educational process requires a change in the attitude of the teacher and student to learning. A means of personal development that can reveal its potential abilities is independent thinking and cognitive activity. The educational process at a university must be organized in such a way that the knowledge acquired in the classroom by students is the result of their own searches. This approach to learning leads to student confidence in their abilities.*

Key words: *planet, radius, diameter, eccentricity, mass, area, volume, axis, period of rotation, density, acceleration, ellipse.*

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МЕЖПРЕДМЕТНАЯ ИНТЕГРАЦИЯ – ПОИСК НОВЫХ ПЕДАГОГИЧЕСКИХ РЕШЕНИЙ

Аннотация: *В данном статье приведена использование новых передовых педагогических технологий при обучении астрономии. Внедрение новых индивидуальных, передовых и педагогических технологий в учебный процесс требует изменение отношения педагога и студента к обучению. Средством развития личности, способным раскрыть её потенциальные способности, является самостоятельная мыслительная и познавательная деятельность. Учебный процесс в вузе нужно организовать таким образом, чтобы полученные знания на занятиях студентами были результатом их собственных поисков. Такой подход к обучению приводит к самоуверенности студента в своих способностях.*

Ключевые слова: *планета, радиус, диаметр, эксцентриситет, масса, площадь, объём, ось, период вращения, плотность, космический скорость, ускорения, эллипс.*

Введение

Развитие системы образования осуществляется в условиях коренных изменений в развитии страны. День за днем возрастающий поток информации требует внедрение таких методов обучения, которые позволяют за короткий промежуток времени передавать большой объём знаний, обеспечивающий высокий уровень овладения изучаемым материалам и закреплении его на практике[1]. Современные методы и технологии обучения, которые способствует овладению обучающимися качественными знаниями, формируют способность к самостоятельному мышлению, рационально распределять учебное время на усвоение урока. Инновационный подход к обучению делает учебный процесс интересным, студенты с большим удовольствием учатся. Внедрение новых индивидуальных, передовых и педагогических технологий в учебный процесс требует изменение отношения педагога и студента к обучению. Средством развития личности, способным раскрыть её потенциальные способности, является самостоятельная

мыслительная и познавательная деятельность. Учебный процесс в вузе нужно организовать таким образом, чтобы полученные знания на занятиях студентами были результатом их собственных поисков[2].

Основная часть

Астрономия – это целый мир, полный прекрасных образов. Эта удивительная наука помогает найти ответы на важнейшие вопросы нашего бытия, узнать об устройстве Вселенной и ее прошлом, о Солнечной системе, о том, каким образом вращается Земля, и о многом другом. Между астрономией, математикой и физикой существует связь, ведь астрономические прогнозы являются результатом строгих расчетов. По сути, многие задачи астрономии стало возможным решить благодаря математике и физике[3].

Приведем пример использования математики и физики при изучении темы «Планета Земля» по астрономии.

Нам известно, что в Солнечную систему входит 8 крупных планет, которые вращаются вокруг Солнца по эллипсу. Планета Земля 3-планета Солнечной системы по удаленности от Солнца и находится на расстоянии 150 миллионов километров от Солнца (это расстояние - 1 астрономическая единица длины)[4]. Зная, расстояние между Солнцем и Землей, можно вычислить длину орбиты (пути) Земли по математическим формулам. Орбита планеты - это кругообразный (эллипс). Также можно будет определить эксцентриситет, площадь, объём и т.д. По физическим законам можно определить массу, плотность, ускорения свободного падения, орбитальную скорость, сила притяжения между небесными телами по закону всемирного тяготения, период вращения небесных тел вокруг своей оси (продолжительность сутки) и вокруг центрального небесного тела (продолжительность года), космические скорости и т.д.[5, 6, 7].

Доску можно разбить на столбце. В первой столбец записать все математические и физические величины, которые характеризует физические параметры Земли[6]. Во второй столбец следует записать все формулы, по которыми определяется физические параметры Земли. Например, таблица должна выглядеть следующим образом.

Таблица 1.

Величины	Формулы
Длина круга	$L_{круг} = 2\pi \cdot r = L_{земля} = 6{,}28 \cdot 150000000\,km =$ $942000000км =$ $6{,}28\ аст.ед.длины$
Эксцентриситет планеты (Он равен половине отношения фокусного расстояния эллипса к его большой полуоси)	$e = \frac{F_1F_2}{2a} = \frac{OF_1}{a} = \frac{OF_2}{a}$ Отметим, когда эксцентриситет эллипса равен нулю, фокусы и центр эллипса сливаются в одну точку — эллипс превращается в окружность, а когда равен 1, то получается прямая линия $e = 0{,}0175$ $Приближенная\ точка\ (перигелий) =$ $0{,}87\ ас.ед.\ длины.$ $Удаленная\ точка\ (афелий) =$ $1{,}03\ ас.ед.\ длины.$
Сила притяжения между Солнцем и Землей	F= $47 \cdot 10^{21}$ Н при приближении к Солнцу F= $33{,}5 \cdot 10^{21}$ Н при удалении от Солнца F= $35{,}57 \cdot 10^{21}$ Н при нормальном расстоянии
Диаметр и радиус	$d_{земля} = 12742\ км;\ r_{земля} = 6371\ км.$
Объем	$V_{земля} = \frac{4}{3}\pi R^3 = 4{,}18 \cdot (6371км)^3 =$ $1{,}08 \cdot 10^{12}\ км^3$

Площадь планеты	$S_{земля} = 4\pi R^2 = 12{,}56 \cdot (6371км)^2 = 509{,}8 \cdot 10^6 км^2$
Масса Земли	$m_{земля} = 6 \cdot 10^{24}\ kg$
Средняя плотность Земли	$\rho_{земля} = \frac{m}{V} = \frac{6 \cdot 10^{24}}{1{,}08 \cdot 10^{20}} \frac{kg}{m^3} = 5500 \frac{кг}{м^3} = 5{,}50 \frac{g}{sm^3}$
Ускорение свободного падения	$g_{земля} = \Omega \frac{M_{земля}}{R^2} = 6{,}67 \cdot 10^{-11} \frac{Н \cdot м^2}{кг^2} \cdot \frac{6 \cdot 10^{24}}{(6371)^2} \frac{кг}{км} = 9{,}81 \frac{м}{с^2}$
Период вращения Земли вокруг Солнца	$T_{земля} = 365{,}2424\ сутки$ (365 суток 5 часов 48 минут 46 секундов)
Период вращение планеты вокруг своей оси	$T = 23\ часа\ \ 56\ минут\ 4{,}9\ секунд$
Орбитальная скорость Земли	$v_{земля} = \frac{L_{орбита}}{T} = \frac{942000000км}{365{,}2424 \cdot 86400с} = 29{,}76 \frac{км}{с}$
Космические скорости на поверхности планеты	$\upsilon_I = \sqrt{g \cdot R} = \sqrt{9{,}81\ \frac{m}{s^2} \cdot 6371000\ m} = 7900\ \frac{m}{s} \approx 7{,}9\ \frac{km}{c}$ $\upsilon_{II} = \sqrt{2 \cdot g \cdot R} = \sqrt{2 \cdot 9{,}81\ \frac{m}{s^2} \cdot 6371000\ m}$ $= 11200\ \frac{m}{s} \approx 11{,}2\ \frac{km}{c}$

Земля имеет плотную атмосферу (потому что ускорения свободного падения на поверхности планеты больше, из-за большей массы), состав которого состоит в основном из азота 78,09% и кислорода 20,95%[8]. Кроме этих газов ещё имеется в меньшие количества инертных газов и др. Атмосферное давление на поверхности планеты в 500000 раз больше, чем у Меркурия:

$$P_{земля} = 500000 \cdot P_{меркурий} = 101325\ \ Па\ =$$

$$1\ \ атмосфера\ \ = 760\ \ мм.рт.ст.$$

Нужно отметить, что с увеличением высоты постепенно уменьшается атмосферная давления (на 1 мм.рт.ст. каждую 12 метров) [9, 10].

Прежде чем заполнить таблицу, студентам следует провести вычисления. В конце занятия преподаватель сверяет правильность вычислений с таблицей.

Заключение

Такой подход к обучению приводит к самоуверенности студента в своих способностях. В таком процессе обучения преподаватель становится консультантом, источником информации и координатором.

Таким образом, проведение таких занятий позволит:

1. Выявить полноту и уровень знаний по астрономии;
2. Активизировать мыслительную деятельность с максимальным развитием её творческого характера;
3. Повысить профессиональную подготовленность и приблизить её к подготовленности студентов высших учебных заведений;
4. Повысить заинтересованность в изучении дисциплины «Астрономия»;
5. Прикладывать больше усилий в освоении теоретического материала студентами, полученных на лекционных, практических и лабораторных занятиях.

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Issue Article

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ANALYSIS OF SOCIAL LIFE IN ARTISTIC JOURNALISTIC GENRES (ON THE EXAMPLE OF THE ANALYSIS OF THE PRESS OF KARAKALPAKSTAN)

Abstract*: This article discusses the artistic publicist genres in the group of journalistic genres and their features of coverage and analysis of events and phenomena in social life. The requirements and theoretical aspects of artistic publicist genres are also considered. At the same time, the emergence of analytical genres in the modern Press of Karakalpakstan, the topics covered in them were analyzed and the corresponding conclusions were drawn.*

Key words*: Features of artistic journalism, social life, problem, newspaper, ocherk, essay, genre.*

Language*: English*

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Introduction

In journalism, a special place is occupied by artistic journalistic genres in the disclosure of events, in the coverage of phenomena through the method of analysis. Artistic journalistic genres, in turn, are divided into several groups. Let's consider the specific features and differences of form inherent in each genre, how they differ from each other.

The main part

The mass media of any state develop and carry out their activities on the basis of the social structure in this country. This is exactly the case with the activities of the mass media in Uzbekistan. That is, today the goal of Uzbekistan is to build a democratic society based on the rule of law, and this trend can be clearly seen in the activities of the mass media. Especially in the last five years. That is, during this period, articles began to appear on the pages of the press, raising questions about the reality of a new era, the upbringing of a new generation as a humanistic, maniacally mature personality, highlighting the desire of the population for a democratic life. In addition, in order for each individual in public life to find his place in the new time, to be brought up as a patriotic person who thinks about the future of the country, the negativity of the population, the media also sought to contribute. These processes were also aimed at a new approach to the mass media of Uzbekistan. According to researcher Dilfuza Kamalova, today the press remains one of the main tools for replenishing the consciousness of not only humanity, but also society as a whole with various information [1; 18-21]. Indeed, today the press and mass media have a special power in promoting high cultural values in society.

Now, when we talk about the genres of journalism, especially its artistic and journalistic genres, it is also believed that they have a special influence on other genres in the coverage of events and phenomena of public life.

The possibilities of the genres of art journalism are especially evident in the press. Because the press is of particular importance in the events of socio–political life, in the direct description, analysis and ensuring their effectiveness.

Researcher of the Uzbek press and publicist M.Khudoikulov divides the functions of the press into three main groups, namely the types of image, analysis and influence. These functions also relate directly to the genres of journalism. From this point of

view, the image function – information journalism, the analysis function – analytical journalism and the impact function - meet the requirements of art journalism. Indeed, the function of exposure is clearly visible in art journalism. Because art journalism, thanks to its artistry, imagery, that is, the use of visual methods of design in fiction, penetrates deeply into public life, leaving a great influence and institutions. In accordance with these characteristics, art journalism is considered as an integral part of literature or as a branch of literature. Because art journalism has the opportunity to freely use all means and methods of literary decoration. In accordance with these aspects, art journalism can be divided into types of drawings (Sketch), essays, journalism, feuilleton, pamphlet and others, depending on the content, essence and form of the materials covered in the press.

I must say that artistic and journalistic genres differ in relation to other genres, firstly, by their artistry, imagery, and secondly, also by the in-depth transfer of such characteristics as imagery, analyticity, criticality in art journalism. That is, in these aspects, artistic journalism also combines all journalistic genres, more precisely, informational, analytical features.

Sketch. This genre has its own peculiarity in the genres of art journalism, which came from the Arabic language and implements the meanings of a sign, a view, a landscape on which something is written in our language. The sketch describes the natural state of an individual object or subject, through which its landscape and appearance are manifested. The function of the sketch genre is to "inform about a fact, an event and an opportunity in life, to acquaint the reader with it. At the same time, the plaque serves the purpose of creating an image that enlivens in the eyes of the reader certain information about people's activities, a broader description of events and phenomena, a view taken from life, different from a simple informational message" [2; 185]. The genre of sketching is considered one of the genres that is very often used in press publications.

Draw. The word draw comes from the Russian words "to draw, to outline", which means "to draw, to draw an atrophiing line". That is, it is by drawing something auditory, drawing the attention of society to it. For example, if one sentence is drawn between the text written on a simple leaflet, then the reader's gaze, who picked up the leaflet, suddenly falls on the sentence in which the label is drawn on the same leaflet.

And in draw on art journalism and literature, attention is paid to the personality, that is, "the image of a person, of course, occupies a central place» [3; 162]. At the same time, issues of public life are also highlighted around the main character in the "essay". That is, "... this genre describes life events and phenomena, facts, problems with the help of artistic means, conducts journalistic research and makes positive, economic, spiritual conclusions reflecting public opinion about them." [2; 190]. Also an essay" ... artistic and journalistic realization of the analysis of a certain image of a person, an actual social problem or a specific process based on specific facts and phenomena. In it, one can simultaneously observe a combination of documentary, accuracy, mobility and literary and artistic means" [4; 164].

So, judicial essays reflect events and phenomena that contradict the laws of society. At the same time, what has happened and the events in it are measured by laws, and justice is done.

Essay. The essay genre is also one of the genres widely used in Karakalpak journalism. The boundary between an essay and an essay is such that the essay has a philosophical look. The famous Polish writer L.Partelsky, Russian researchers L.V. Timofeev and S.A. Turaeva also mentioned the requirement of a rational attitude to the genre of essays.Therefore, the lyre in the scientific, journalistic and philosophical direction is an epic genre that is built on the basis of the creator of fitrati – the author's essay [5; 18]. The word essay from French, which, in our opinion, means "experiences", is also used in the Uzbek language in the form of badia. Most scientific sources recognize this genre as free. The main reasons for the emergence of the essay genre as a separate genre in literature and art journalism is the work of the French writer Michel Montin "Les essais", that is, "experiments", written in 1580. This genre has been studied in modern Uzbek and Karakalpak literature. But, using the example of journalism, it has not been studied specifically until now.

Genre of the story. One of the most common genres in Karakalpak journalism in recent years is the genre of short story. Although in fact the genre of the story is often recognized as a literary genre, it was very often used in the journalism of the Karakalpak press, that is, it covered important issues of public life characteristic of modern journalism.

Among the journalistic materials in the genre of short stories in the press, the stories published under the authorship of Omirbay Oteuliev stand out in particular. If you pay attention to the merits of the author's stories, then he mainly covers the topic of ecology, nature in the language of his hero or interlocutor.

From this it can be seen that there are many materials in the genre of the story in the press. They mainly reflect events and phenomena, problems in our public life today. That is, the possibilities of the genre of the story are fully used in today's Karakalpak press.

Conclusion

In conclusion, it should be noted that in artistic and journalistic genres, social life is interpreted in various ways and in different directions. The main goal is to solve the problem by literary and artistic means. At the same time, artistic and journalistic

genres serve to form a social attitude in society and encourage the population to solve the problem. The results of the study show that articles typical of artistic journalistic genres are not covered with sufficient skill in the modern press of Karakalpakstan. The articles covered do not meet the requirements.

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Issue Article

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THE DISSYMMETRY OF RELIGION, PHILOSOPHY AND SCIENCES IN THE FORMATION OF A UNIFIED SCIENTIFIC WORLDVIEW

Abstract*: The article presents the issues of a unified worldview, the importance of ensuring harmony through dissymmetrization between religion, philosophy and science, justified by means of scientific and philosophical analysis. In particular, the role of religious views on the example of Islamic teaching in the development of scientific progress of natural science knowledge is shown. Also, as a result of the interaction of science and religion, the most important aspects achieved by humanity so far and which can be achieved in the future were analyzed, appropriate conclusions were drawn, suggestions and recommendations were given for the tasks to be implemented in this direction.*

Key words*: The universe, the world, religion, science, philosophy, physics, metaphysics, unified worldview, religious and scientific knowledge, verse, harmony, world order, symmetry, dissymmetry.*

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Introduction

Today's modern civilization is characterized by a very high and rigid, but at the same time extremely dangerous orientation of its activities to meet the material needs of humanity in comparison with spiritual ones. Many universal problems, such as ecological imbalance, the spread of various diseases on a global scale, the problem of preserving peace and food shortages, the growth of moral perversions, force humanity to resort to religious doctrines again.

This is due to the need to revise the philosophical issues of the interaction of science and religion, to achieve not only material, but also spiritual progress of mankind on the basis of achieving religious and scientific knowledge and thereby ensuring world order (or symmetry). As you know, the scientific worldview is an understanding of the world in a single integrity, consisting of the highest interconnection (synthesis) of knowledge, experience, beliefs, ideas and feelings formed in people. Each of these constituent parts constitutes the necessary content of the worldview, and the absence of one of them (asymmetry) changes the entire structure of the worldview as an integral phenomenon. Here, understanding symmetry as a stable (stationary or permanent) state, and asymmetry as unstable (non–stationary), we thereby accept two such points of vision as congruent in this aspect of consideration. In connection with the worldview aspect, attention is drawn to the congruence of another worldview conclusion, characteristic of synergetic constructions and constructions based on dissymmetry (self-organization). Both points of view recognize the material unity of the world at its various structural levels. ...According to the principle of dialectical unity of symmetry and dissymmetry, every living object has one or another form of this unity [1, p.375]. Having certain advantages in achieving harmony of religious and scientific knowledge through dissymmetry, no one could deny that universal progress is the product of both knowledge. Understanding of the Universe, phenomena and processes related to its various dimensions, forms of a system of views, methods, sets of norms, principles, criteria inherent in religion, philosophy and science, including their dissymmetrization (self-organization),

are becoming important in the formation of a holistic (unified) scientific worldview among people.

Many well-known physicists currently believe that in the future science and religion will unite and unite. In this union, science studies the order and law in the universe, and religion seeks to understand and expose the purpose and meaning of the universe. For this reason, the tasks they set themselves are practically the same, which means that they will be harmoniously combined through dissymmetrization in the future. Indeed, according to the history of mankind, science and religion do not interfere with each other, and neither of them can replace the other or destroy each other. Scientific knowledge and faith cannot limit each other even because they are infinite. Although both scientific knowledge and faith are true realities, they represent to some extent access to a limited existence.

Medieval Islamic religion, philosophy and their harmony (symmetry) with science - for the peoples of the Middle East and Central Asia opened the way to the Renaissance or "Renaissance", initiated the translations of works on the philosophy of antiquity by thinkers, their comments are given. At the same time, during this period, changes were made to the methodology of scientific knowledge of the Universe, original methods of scientific research in the field of natural and exact sciences were developed, on the basis of which invaluable discoveries were made.

Science and religion - as two forms of cognition of the world.

The concepts of symmetry and dissymmetry of mutually related objective characters are inseparable from the ongoing processes of symmetrization and dissymmetrization, and their semantic significance, manifested at any structural levels, at all times as self-organization of matter and worldview. Therefore, a scientific worldview is a value that can reflect the past heritage of humanity, current life, sciences and cultures of the future. Everyone knows that religion, science and philosophy are an inseparable part of society, since it, having integrative and regulatory functions, largely determines the point of view, i.e. a person's worldview. In turn, since these laws of symmetry (perfection) are fundamental in changing systems, and dissymmetry (broken symmetry) – an integral condition of the processes of change – has a universal character [2, p.116].

However, the main difference between the views of the unnatural in the West and the East was that in the West mystical schools have always played a supporting role, whereas in the East they served as the basis for most religious and philosophical systems. Comparing the worldviews of the greatest naturalists and philosophers of antiquity with the worldviews of the thinkers of Central Asia, we are once again convinced that in the Middle Ages there were great changes in the history of science and philosophy. If in Plato's views the creation of the universe was a matter of attachment to its creator, then the great thinker Aristotle said: "God is a matter of self–sufficient reason... and his mind is a matter of thinking." Ancient natural scientists Thales, Empedocles, Democritus, Euclid, Archimedes, Ptolemy and others considered nature alive, worshipped it and man never opposed himself, and also created his scientific programs on this basis.

Although in the early Middle Ages there were no scientific programs with a certain orientation in the Islamic world, a new worldview was created in religion, philosophy and sciences, based on scientific conclusions, concepts, research methods, which later became extremely important and even decisive in the development of philosophy and science of Modern times.

In the initial period of the formation of the religion of Islam, there were no disputes on issues of doctrine, worship, religion and law, religious and secular science, religious community and the state. Because the Word of Allah Almighty, sent down to Muhammad (sallallahu alayhi vassalam), there was no need for logical and mental discussion and philosophical observations, there was no need to find another source to prove the truth of expressions, as a result of which Muslims firmly and absolutely believed in it, and not just accepted the truth in it. Because the holy book of the Islamic religion, the Koran, contains on the basis of the principles of perfection (symmetry), many verses (verses) that encourage the discovery of true causal laws in events, phenomena, processes occurring in the Universe.

Peter Adamson, professor at King's College London writes: "The vast majority of the verses (verses) The Qur'an calls a person to observe this bright universe, recognize its perfection and learn to understand it. After all, this diverse world that surrounds us was created by the power of infinite wisdom, divine justice, kind and merciful. That is why Islamic scholars who lived in the Middle Ages knew that science is a way of knowing who created it and a way of knowing who it is"[3, p. 56].

Famous researchers of the history of science J. Niddam, V.I. Vernadsky, A.Koire, without denying the scientific revolution of the seventeenth and eighteenth centuries in the West, opposed those who denied that the achievements of Eastern and Islamic civilizations made a significant contribution to the emergence and development of this revolution. For example, A. Coire, recognizing that medieval Arabic, including Central Asian philosophy, served as a kind of bridge between antiquity and the European Renaissance, and said: "The teachers and mentors of the Latin West were Arabs." At the same time, not knowing that many famous philosophers and scientists who wrote in Arabic were from Central Asia, he notes that "Without Farabi, Ibn Sina or Ibn Rushd, Western Europe would never have understood

the teachings of Plato, Aristotle and other great thinkers of antiquity of that time [4, p.49].

Thinkers such as the great philosophers and naturalists of Central Asia Farabiy, Beruni and Ibn Sina, who deeply realized the importance of science in the life and maturation of mankind on the basis of Islamic teachings, created a philosophy in which scientific and religious knowledge are harmoniously combined in the creation of the Universe. From this information, an important conclusion follows that scientific knowledge was formed not only under the influence of people's activities in meeting their needs arising in their daily lives, but also under the influence of religious teachings. In this matter, Farabiy (873 – 950) and Beruniy (973 – 1048) are a great merit. It is noteworthy that they synchronized the thoughts of Farabiy in his treatise "The City of Virtuous People" wrote: "Religion, like philosophy, is aimed at studying reality. While philosophy studies the material world in cognition, determining cause-and-effect relationships, religion approaches reality not by this method, but by calling to faith through the use of figurative, symbolic, comparative representations" [5]. On the other hand, Beruni in his "Monuments of Antiquity" and "India" emphasizes that "religion is also knowledge, and such knowledge is applied where things and phenomena cannot really be studied by evidence. Religious knowledge is based on unproven faith, and scientific knowledge is based on proof" [6], testifies to the high thinking of a scientist whose scientific conclusions correspond to modern views. Therefore, during these periods, science and religion were established and developed as two forms of cognition of the world, and in the process of forming a scientific worldview, they rose to the level of conviction. E. faith.

Beruni believed that the pursuit of knowledge of the essence of natural phenomena includes work based on a natural interest, long-standing from God, as well as on strictly necessary foundations and laws revealed in the process of cognition over many years, cyclically repeating results. Based on this principle, Berunius determined the angle of inclination of the ecliptic to the equator, as well as its secular changes (periodicity). This angle for the year 1020 was equal to 230 34/ 0// , according to modern calculations, this is a value for 1020 g. 230 34/ 45// and surprisingly, it is equivalent. The thinker developed a method for measuring the radius of the Earth during a trip to India, the value of which is 1081.66 farsakh, i.e. 6490 km [7, p.300]. He expressed the idea of the movement of the Earth around the Sun and considered the geocentric theory very vulnerable, whereas in Europe naive ideas of the Earth as a flat cake covered with a crystal cap and surrounded by the ocean prevailed.

Abu Ali Ibn Sina (980-1037) achieved high heights by synthesizing the achievements of Greek and Arabic medicine. His main philosophical, encyclopedic work was The Book of Healing, which consisted of four sections: logic, physics, mathematics (geometry, arithmetic, music, astronomy) and metaphysics. This work also reflects the Persian "Book of Knowledge" ("Danishname"), in which Ibn Sina considered physical science as an important part of his philosophical systems. At a time when logic is considered as a method of cognition, which is a continuation of physics, the next section examines all everyday life with the help of metaphysics. Ibn Sina emphasizes the spontaneous harmony of nature compared to man. He gives an anthropological interpretation of this harmony, seeks to find the principles of harmony in the structure of the human body and in the spiritual appearance of man [8, p.157].

He, as a philosopher, tried to describe the rules of Islam using the logic of Aristotle and concepts from the nascent Greek metaphysics. For this reason, "the philosophical tradition of Farabi was supplemented by significant, profound ideas of Ibn Sina, and it was here that new horizons appeared, which remained unresolved due to lack of opportunities or lack of time in Farabi's time. The scholar Ibn Sina ("Muslimus Soni") drew new conclusions from the theories created... Ibn Sina's genius talent was focused on the science of logic, while he researched philosophy, linking it with various aspects of physics and theology"[9, p.51].

Ibn Sina creates a "great metaphysics" based on the understanding that the world itself is accidental (possible), but necessary from the point of view of the causal chain and teaches that the world is an accident and at the same time its real necessity. He believed that in his views – the identification of "chance and necessity" is unrealistic. L. Goodman, who studied the work of the scientist, believes that Ibn Sina in this teaching carried out the synthesis of scientific determinism of Aristotle and the metaphysical concept of "randomness" in Islamic theology. Goodman, analyzing the correspondence of Ibn Sina's ideas to the views of medieval philosophical thought to the views of philosophers of a later period, noting that "Ibn Sina should not be considered from among philosophers such as St. Augustine, Thomas Aquinas, Maimonides or Descartes, but from among philosophers such as Spinoza, Kant, Hegel and, possibly, Whitehead, Husserl or Dewey, who has the reason for his strictness in metaphysics,"[10] comes to the conclusion.

The famous British philosopher B. Russell, noting the scientists who had a great influence on the philosophical progress of the European Renaissance, wrote that "two great philosophers passed in the Islamic world, the first – Ibn Sina, and the second - Ibn Rushd," but also recognized that Ibn Sina's new ideas about the science of logic were later reproduced by ibn Rushd and Albert the Great.

According to Ibn Rushd (Latin name Averroes, 1126-1198), there can be no contradiction between

philosophical conclusions and the Qur'an.: “Since this religion is true and approves of research that offers knowledge, we Muslims know that studying with the help of reason does not lead to conclusions that contradict what the Qur'an teaches. Such truth does not contradict reality, but harmonizes with it and testifies to it” [11]. Even due to the fact that Ibn Rushd effectively used the “principle of interpretation” in Western philosophy, not everything in the Quran should be understood in this case, since it acquires an “internal” and “external" meaning. If the exact interpretation of the surah of the Quran seems contrary to common sense, then the surahs should be interpreted metaphorically or allegorically allegorically. That is, it is necessary to obtain not the explicit meanings of ayats and hadiths, but their hidden content. Since these thoughts subsequently had a serious influence not only on Imam Ghazali, but also on Thomas Aquinas, the term “averroism” represented Western scholasticism until the XVII century. According to this, although “philosophical truth” and “religious truth” are inherently considered independent of each other, religion and philosophy or religious and scientific knowledge must compromise.

Imam Ghazali (1058-1111), repeatedly looking back at questions of philosophy and recognizing the correctness and usefulness of some of them, knew that philosophers were most mistaken in matters of theology... “The reason for this was the introduction and foundations that were felt in mathematics and natural sciences, which philosophers knew and with which they could reach the truth about the unknown. However, the science of theology is the exact opposite. In theology there is no foundation, no introduction, no sensations, no comparisons. That's why philosophers got lost in most questions of theology” [12, p.53], he writes. Western scientists and philosophers who have studied Latin translations of Ghazali's works since the XII century, according to such as John Benjamin, Francesco Petrarch, August Tolik, “Ghazali found such high qualities in religion and philosophy that with their help the foundation of all true religions is laid, based on the inner meaning - essence, religion – gives to everyone philosophers of air and water, and having proved that air provides the necessary spiritual food, his science revealed the common roots of the invisible, mysticism and philosophy. Ghazali's work "Tahafut ul-falosif" (“Refutation to Philosophers"), which had a significant impact on the development of world philosophy, for centuries had a significant impact on the philosophical views of Eastern and Western philosophers and theologians Thomas Aquinas, Rene Descartes, Hegel and others”[13, p.482]. Ghazali believes that if a person really believes in the light of Allah, then he will have knowledge capable of predicting events, events in the universe, he will be a scientist, he will be in harmony with him, because they are close to Allah. He compares the possessors of such faith with the oil obtained from a walnut.

Science and Religion in the modern world.

Nowadays, Professor of the Faculty of Physics of Moscow State University Yu. S. Vladimirov clarified the relationship between metaphysics and theoretical physics: “If metaphysics is a unified system of ideas covering all spheres of knowledge and culture, including religious and philosophical teachings, a scientific picture of the Universe, then in theoretical physics metaphysics implements two approaches to reality, namely holism and reductionism. The first focuses on the whole, and the second focuses on the parts. Both approaches complement each other” [14, p.21], he writes. That is, the holistic approach focuses on the fact that the whole acquires a new property based on the interactions of the parts that make up the system, while the reductionist approach consists of the desire to apply previous methods to cognitive processes, allowing interpreting the general scientific picture of the Universe based on the initial simple principles by moving from complexity to simplicity.

In accordance with Vladimirova's opinion, it is necessary for a modern physicist to believe that the original faith is widespread both in physics and in religion. “Belief in the existence of the external world," writes A. Einstein, "is the basis of all natural science, regardless of the perceiving subject. Those who are seriously engaged in science believe that there is some kind of force involved in the laws of nature, and this force is much higher than human. Therefore, an objective study of science leads a person to religion. If religious attributes disappear, science will turn into a soulless, simple experience”[15, p.136]. Consequently, our views on the universe and its structure will depend on the level of development of science, our beliefs, the system of concepts used to describe the Universe.

Both religion and scientific data indicate that every person has faith in the existence of some absolute, omnipotent, supernatural force in his nature, psyche, soul. Such a belief, a consequence of the fact that faith is instilled in him, cannot but affect the result of mental development. That's why we try to take a deeper look and study everything that exists in the universe, and be sure that nothing happened by chance and just didn't change by itself. Only then do we fully believe that everything is intelligently created by someone or something who has a superpower in relation to us and develops according to certain laws.

Dr. Paul Clarence, who shrewdly observed such a situation, said: “A person constantly feels the presence of a stronger mind than his own, a higher skill than his own. This leads to faith in God”[16, p.27]. Louis Pasteur, a well-known microbiologist and one of the founders of symmetry theories, writes:

"Faith has never turned out to be the opposite of progress. After all, any progress only reveals miracles in God's creations. If I am more knowledgeable today than yesterday, then my faith in Allah is also stronger than yesterday"[3, p.290]. For this reason, in Christianity it is understood as the original, possessing such power, the first basis - God, in Islam – Allah, Taoism-Tao, etc. Similarly, "modern physics has an original idea, which is the first basis of all types, which is expressed in quantum theories as follows: the initial and final states of a quantum system, as well as the probability amplitude of the wave function"[14, p.21].

The reaction of the scientific community to these opinions, as expected, requires extreme caution. It is not surprising that modern scientists do not want to recognize the correspondence of religious ideas about the structure of the universe, mystical ideas, albeit accidental, to their private scientific results, since mystical science in Islam, especially in the West, has always been interpreted as a mystical and unscientific (supernatural) factor for anyone, and it has had its effect on scientific people.

Taking into account that the universe is infinite and extremely complex, we should seriously think about the existence of some unknown matter (field or vacuum, particle) that regulates certain relationships between existing bodies, ensures their movement, transmits interactions and the force that controls them, as well as about the nature of the universe. Because the desire to get accurate data about the mechanism and speed of propagation of effects is what changes our perception of the universe, directing it in a new direction.

Under these conditions, modern scientists who adhere to integrative thinking based on interdisciplinary integration tend to gradually change attitudes to religious beliefs in a positive way, seeking to expand the scope of application of the results of physics of the XX century. One of the main reasons for this is that modern physics (especially microcosm physics) has always offered us a type of worldview that is very similar in many ways on the traditional religious worldview.

It is known that the unnatural views on which it is based are present in all religions, and many schools of Western philosophy contain elements of mysticism characteristic of Islam. In fact, the same applies to the similarity of religious beliefs with current beliefs not only in the Hindu Vedas, it can also be found in the I Ching or Buddhist sutras, as well as in the passages (fragments) of Heraclitus and in the mysticism of Ibn Arabi or in the teachings of Don Juan.

It is clear to everyone that both scientific knowledge and religious knowledge are formed in the process of studying and cognizing the same calculable world around us: scientific knowledge studies the real world, and religion studies the same world, that is, the world created by God. As a result, the creator himself becomes the object of knowledge. Thus, while science studies the scientific essence of nature and the universe as a whole, religion studies its moral aspects through the knowledge accumulated in people. In other words, although science studies the system of hidden phenomena, events, processes in the Universe and interactions and relationships between them, its first cause, the absolute basis, the problems arising in it, cannot come to a final conclusion within its framework. From this it can be seen that science can study only the core of an integral being, a certain part of its internal structure, which is an intermediate layer. Religion, on the other hand, explores, linking the beginning and the end of this core, the whole being and its relation to the first foundation. That is why modern philosophers, as well as scientists conducting research in different directions, talk about the convergence of science and religion, which is mentioned in the arguments of outstanding theologians, about strengthening their relationship between representatives of scientific and religious knowledge. This is written in particular by the American theologian H. Rolston, one should pay attention to the following analogy: "Just as an electron can be considered as a wave and a particle at the same time, the relationship between science and religion can also be considered in this way, in the sense that they can both exclude and complement each other"[14, p.191].

Conclusion

The phenomena and processes discovered in modern quantum physics give rise to amazing and extraordinary difficulties in the microcosm. Many scientists were not satisfied with positivist philosophy, which misinterpreted the theory of knowledge, denying religion and "metaphysics", rejecting old philosophical ideas, excluding problems directly related to the worldview in science.

Therefore, starting in the 1930s, physicists began to look for philosophical directions that could answer the complexity of the problems of the microcosm and the megastore. The solutions to the problems were answered by the famous physicist N. Bohr, who says, "If scientists need "unthinkable ideas," then they can only be offered a new worldview. Such a new worldview can give Europeans Eastern religions and philosophical teachings, since religion and religious philosophy can participate in the study of the Universe in close alliance with science" [14, p.19]. Indeed, the unity of philosophy and science can satisfy the material and spiritual needs of a person in his attitude to the environment, at the same time determining his place in the Universe, creating a holistic scientific worldview, which is a set of views on the world around him.

We believe that it is necessary to effectively use the possibilities of philosophy to ensure the

relationship between scientific and religious worldviews, as well as the harmony of scientific and religious methods in the process of cognition, since it recognizes the boundlessness of both knowledge and faith. Only then will science be able to be enlightened by the light of religious faith and reflect its spiritual content, as well as its humanistic essence.

Therefore, in order to create a unified scientific worldview that serves the well-being of all mankind and allows us to adequately represent the universe - the modern interrelation of religion, science and philosophy, it is necessary that ensuring harmony becomes the main task of researchers working in all fields.

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Contents

		p.
20.	**Maxmudova, M.** A new person transforming reality in K.G. Paustovsky's story «Valor».	201-203
21.	**Axmedov, Yo. O.** Formation of information and didactic skills of future physics teachers.	204-207
22.	**Musurmonov, M. U.** Methodological aspects of the laws of symmetry and conservation in physics.	208-212
23.	**Kalabayeva, M. A.** Intercultural approach in teaching English somatisms to students of philology in Karakalpakstan.	213-216
24.	**Karabayeva, A. S.** Techniques for developing students' creative thinking in Russian language classes.	217-221
25.	**Akbarova, R.** The use of mind-educational maps when working with text based on the work "Black Arab" by M. Prishvin.	222-230
26.	**Baybekova, K. R.** Linguoculturological commentary and its linguodidactic significance in the study of works of small prose in a foreign language audience (based on the material of V.P. Astafyev's stories from the collection «Zatesi»).	231-234
27.	**Basilashvili, N.** The role of civil society in the development of democratic processes.	235-237
28.	**Chikovani, M., Kupatashvili, N., & Jolokhava, M.** Hidrochemical analysis of some fresh waters of Lejokhe, Letane and Mikawa villages of Tsalenjikha municipality.	238-241
29.	**Smolkov, M. I.** Method for generation of new porous materials based on triply periodic surfaces.	242-248
30.	**Mdzinarashvili, B.** Democratic Discourse, Media pluralism and the Threat of Deepening the Confrontation.	249-253
31.	**Tojiyeva, B. B., & Usmanov, N. N.** Influence of winter side crops on yield and seed quality of potato varieties.	254-262
32.	**Kuldoshev, A. T., & Stolyarova, A. N.** Impact of social factors on security.	263-266
33.	**Frolov, M. A.** Mechanical properties of porous material based on triply periodic surfaces obtained from the atomic network of sodalite.	267-273
34.	**Sattarov, A. R.** Methodological foundations of teaching the subject of astrophysics based on an integrative approach.	274-277

35. **Kamolov, I. R.** 278-281
Intersubjective integration – searching for new pedagogical decisions.

36. **Marziyaev, J. K.** 282-285
Analysis of social life in artistic journalistic genres (on the example of the analysis of the press of Karakalpakstan).

37. **Bekpo'latov, U. R.** 286-291
The dissymmetry of religion, philosophy and sciences in the formation of a unified scientific worldview.

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International Academy of Theoretical & Applied Sciences - member of Publishers International Linking Association (USA) - international Association of leading active scientists from different countries. The main objective of the Academy is to organize and conduct research aimed at obtaining new knowledge contribute to technological, economic, social and cultural development.

Academy announces acceptance of documents for election as a member:

Correspondents and Academicians

Deadline - January 25, 2024.
Documents you can send to the address T-Science@mail.ru marked "Election to the Academy members".

The list of documents provided for the election:

1. Curriculum vitae (photo, passport details, education, career, scientific activities, achievements)
2. List of publications
3. The list of articles published in the scientific journal ISJ Theoretical & Applied Science
   * to correspondents is not less than 7 articles
   * academics (degree required) - at least 20 articles.

Detailed information on the website http://www.t-science.org/Academ.html

Presidium of the Academy

International Academy of Theoretical & Applied Sciences - member of Publishers International Linking Association (USA) - международное объединение ведущих активных ученых с разных стран. Основной целью деятельности Академии является организация и проведение научных исследований, направленных на получение новых знаний способствующих технологическому, экономическому, социальному и культурному развитию.

Академия объявляет прием документов на избрание в свой состав:

Член-корреспондентов и Академиков

Прием документов осуществляется до 25.01.2024.
Документы высылаются по адресу T-Science@mail.ru с пометкой "Избрание в состав Академии".

Список документов предоставляемых для избрания:

1. Автобиография (фото, паспортные данные, обучение, карьера, научная деятельность, достижения)
2. Список научных трудов
3. Список статей опубликованных в научном журнале ISJ Theoretical & Applied Science
   * для член-корреспондентов - не менее 7 статей,
   * для академиков (необходима ученая степень) - не менее 20 статей.

Подробная информация на сайте http://www.t-science.org/Academ.html

Presidium of the Academy

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