is experiencing today a complex and contradictory period of its cultural and linguistic development is demonstrated by the language situation, the characteristic of which is given in the Concept of the language policy of the Republic of Kazakhstan. It should be noted that virtually in all the documents in the language policy a core idea is the necessity of mastering several languages. The concept of expanding of the scope of functioning of the state language, improving its competitiveness in 2007–2010 is aimed at improving the quality of teaching the state language, ensure of the functioning of the state language in all spheres of public life, enhancing its role as a factor in strengthening inter-ethnic harmony and Kazakhstan patriotism. The concept of the language policy of the Republic of Kazakhstan determines the Russian language as the main source of information on various fields of science and technology, as means of communication with the near and far abroad. In this regard, the problem of language education has a new sound. Source in this case is the idea that learning any language must be accompanied by the study of culture of native speakers. Moreover, this process should be sinkretly, not in separate planes. In this regard, it would be correct to speak about poly-lingual cultural education, which's result should be multilingualism of citizens of society. Terms of multilingualism should form the native language, that reinforces the awareness of belonging to their ethnic group, the Kazakh language as the state, ownership of which contributes to the successful integration of civil, Russian language as a source of scientific and technical information, and other non-native foreign languages, which develop the human capacity for self-identity in the world Community. Therefore, the study of language as one of the main indicators of human adaptation to the new socio – political and socio- cultural realities is now an actual scientific and theoretical, scientific and practical task. In addition, was objectively occurred necessary to rethink the traditional concepts of language policy and language situation, which were established in period of independence.

Most clearly this problem in relation to the language situation of modern Kazakhstan is reflected in the Message of President of the Republic of Kazakhstan Nursultan Nazarbayev "New Kazakhstan in a New World" from 2009, where in order to ensure the competitiveness of the country and its citizens was offered a phased implementation of the cultural project "Trinity of languages", according to which we need to develop three languages: Kazakh as the state language, Russian as a language of international communication and English as the language of successful integration into the global economy. Under these conditions, the problem of formation and development of multilingual education is updated, including issues of development of its theoretical and methodological grounds. Answers to questions related to the problem of multilingual education due to its versatility and diversity, can be found only on the condition of the study, systematic and comprehensive analysis of the theoretical concepts of various scientific schools. Therefore, for our study works of scientists in the field of philosophy, ethnology, pedagogy and ethnopedagogy, sociology and ethnosociology, psychology and ethnopsychology, linguistics and ethnolinguistics serve as a methodological reference. Thus, the ideological positions of our study are defined by philosophical teachings of A. Kunanbaev, which has directly relevant to the issue of identity and its formation by the essence of the sociological concept of Sh. Valikhanov and by the ideas of Kazakh educators and teachers Altynsarin I., Aimauytov J., Baitursynov A., Zhumabaev M. And etc., that allow to realize the importance of the mother language in the development of personality.

It is known that only the state can successfully develop and blend well with a number of leading countries in the world that will be able to create for its citizens decent working conditions for the acquisition of high-quality and modern education. Kazakhstan, remaining ethnic and confessional state, is experiencing today a complex and contradictory period of its cultural and linguistic development is demonstrated by the language situation, the characteristic of which is given in the Concept of the language policy of the Republic of Kazakhstan. It should be noted that virtually in all the documents in the language policy a core idea is the necessity of mastering several languages.

Polylingualism – the way to the future. In modern world due to the processes of self-determination of nations, formation of multinational states, the active migration of population the legal solution of issues of language in society became very important task of the state. At first, problem concern the legislative enforcement of languages in the formal and informal communication, in language teaching in schools and universities, in the relations between nations.

Currently, different countries have accumulated some experience of bilingual

education. This occurs in regions with natural bilingual environment (Canada, Belgium, Switzerland, etc.), and in states where there is an influx of immigrants who are forced to get used to grow into a foreign culture (the U.S., Germany and others). In these countries, there are various bilingual courses in which languages are studied not only as a means of communication, but as a way of acculturation in country of studied language, introduction with its history. There is an experience in creating of bilingual schools in several cities of the CIS, which is based on the idea of implementing the concept of continuous bilingual education, from kindergarten to higher education institution.

The aim of education at the present stage are not just knowledge, but also the formation of core competencies that should equip young people for life in society. Five core competencies, required for any specialist today are identified by Council of Europe. Among them – the ability to communicate orally and in writing, that naturally implies the mastering several languages. The main aim in teaching foreign languages to the citizens of European Council is multilingualism: possession of every person in Europe at least two foreign languages, one of them – actively. We can designate the hierarchy of the most studied foreign languages in the Old World, which determine the language policy for the new millennium: the French – Russian – Spanish (Italian – Portuguese). A study, conducted in Germany, showed that for 80 percent of European countries requires knowledge of at least two foreign languages, especially English and French (in conjunction 25:1), and 45 percent – at least three languages (Spanish, Italian, Russian). Not only the exporting firms need knowledge of language, but also importing firms need. In determining the language policy, all three hypostasis are taken into account: the history, present and future. Isolation of only one of them, according to experts, violates the essence of language, preserving a history that enables to live in the present and opening the way to the future. Therefore, literature and culture of the country of the studied language are integral parts of the content of teaching foreign languages. The European Union is one of the compelling examples of aspirations of the modern world to keep polylingualism. Achieving this goal is conceived on the basis of the preservation and support of all the languages of national minorities in Europe. This program is funded and supported by the government and parliament. Modernization of the education system, which is carried out in our country, is primarily concerned with updating of the content, ensuring of its active, developing, culture consistent character with demands of the modern labor market for the mobile professional, communicative competence and creatively thinker professionals. In connection with updating of the content of education, attention is focused on the creation of conditions for the development of the creative personal potential of the student's and expansion of opportunities of in-depth education, including language training. One of the important tasks of any educational institution is the communion of the younger generation to the universal, global values, the formation of children and young people's ability to communicate and interact with representatives of neighboring cultures and in world space. Along with the Kazakh language, which has the status of the state language, and Russian – language of interethnic communication, an important tool in this case, of course, is foreign language. There is a need to consider the role of foreign language in language education of students. It can not be considered as complete if students did not learn at least one foreign language or doing it with a break and bad. We can say quite definitely that not only educational, but also psychological damage is applied to deprived of this right students. The graduates of such schools has a "complex of humanitarian and linguistic inferiority". In a multicultural ethnogeographical space the substantial part of the population is bilingual. Enriching the student by the heritage of two cultures, bilingualism puts him in more favorable conditions, compared to the conditions of the student who is embarking on the study of a foreign language with knowledge of only mother language. As it is well known, thanks to the phenomenon of transfer, studied foreign language, native and Russian languages enter into the complex interaction, which stimulates or conversely inhibites the process of learning a new language. Comparing three languages, you can pre-identify challenges, anticipate and take into account the typical mistakes, understand the nature and cause of the errors, establish an order of sequential study of linguistic material. At the same time, practice shows that, for example, in rural schools, where social burden usually falls on the mother language, conscious mastery of the material in a foreign language can be successfully implemented under the condition where the teaching is carried out with the support it in own native language. Learning the state language, Russian as a language of international communication, and one foreign, as one of the strategic objectives, defined by

the Concept of Development of Education until 2015, guarantees the achievement of educational goals through initiation to a different culture, history, geography, literature, art, science. In doing this, increasing knowledge of own native culture as part of a single world culture, and more conscious and deep mastery of the mother language. Research and practice of interconnected training to native and foreign languages show the enrichment and the positive impact of languages on the full development of personality of students. In this context, transition to learning a foreign language from the 2nd class appears as scientifically valid and legitimate transition. Early learning of foreign language, continuity and coherence in foreign language education allow the use of language, not only in its communicative, but also in cognitive function. The concept of "learning of subject knowledge in a foreign language" suggests the use of language as a means to give students defined knowledge on the subject. Effectiveness of teaching some subjects in a foreign language, taking into account characteristics of the national educational system is proved by experience of several schools in the CIS. Polylingualism and polylingual teaching to foreign languages are an absolute necessity, the imperative of our time, because the whole world is poly ethical, polylingual. And in solving the main problems of the modern world – harmony and understanding between people, overcome the difficulties of interethnic communication, intercultural communication, the maintenance and promotion of situation of polylingualism in each country and between countries can contribute in a greater extent. In my opinion polylingualism – it is not only the development of the country but also the development of itself, as a man of the XXI century. If you want to know the culture of the country you have to learn its language.

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ECOLOGICAL ASPECTS IN FAMILY EDUCATION

Khusainov Z.A.
Kazan (Volga region) Federal University, Kazan, e-mail: zaudet@inbox.ru

Every nation has its unique, developed over many years, educational system which covers all aspects of training children for their future life. National pedagogy, improving and getting better and better, is passed from generation to generation, it becomes the heritage of parents giving positive educational results. There is a big gap in the modern concept of family upbringing of Tatar children due to the loss of the traditional pedagogy of the Tatar people. In ancient times the Tatar people used their own educational system to bring up their children. A caring attitude to nature as one of the manifestations of morality was reflected in the national system of education.

Keywords: ecological aspects, family education, Tatar children, traditional pedagogy

As shows socially-historic experience, non-acquaintance with culture of your own nationality, its past, presence means breaking up of ties with generations, that cripples in formation of pupils` ecologic culture and creating of ecological space.

No one else, but Kayum Nasyri, one of the Tatar writers, scientists, teachers of the second half of 19th century, didn`t stand for importance of native language in education process. He put a lot of effort in order to Tatar language becomes the language of science and literature. Kayum Nasiry attached the greatest importance to family upbringing, give some advises to parents, by this developing on them the pedagogical culture. “Upbringing is not cares during the feeding, at the same time it is living him and caring about his moral perfecting, inoculation of noble manners, intention to make from him considerable human, knowing the science and decency conception”.

Following K.D. Ushinsky, K. Nasiry advanced an idea of education nationality, highly estimating environmental education traditions of Tatars. At that time the word “ecology” weren’t used, but such a notion were in scientist`s doctrinal content. Communication with people, gaining inside into spiritual world and culture of his people helped him to write and publish valuable information on environmental education and widely used them in his pedagogical activity. His works “Education book”, “Forty gardens”, “Morality book” have great information about Tatar folk pedagogy and ecology.

Every nationality has its own system of education, which includes different methods of children training to future; they have their own pedagogics, passing from generation to generation. Ethno pedagogics being the result of public creative idea of many generations, expression of interests of popular majority, in accordance with its requirements to environmental safety, ethno pedagogics put forward ecologic standards in the sphere of youth generation upbringing.

Taking into account loss of traditional pedagogics of Tatar people, there is a great omission in modern conception of children education. In ancient times people brought up their children according to their own system. Consisting of two or three generations family put child wise, implanted morally-ecologic culture, respect for environment and people. There were nature oriented and common interdictions in people`s tradition those times. For example a wide range of ecologic bans to living world, nature.

Tatar people were shooting for one or another animal at a given time, at the same time don`t making any harm; for instance, “weeks of quarter” are conducting in breeding period, it was forbidden to touch the eggs in nests. Parents explained it with the following facts: birds can send diseases and different fiends, which kept children from bad behaviors.

Especially it referred to birds, living nearby with human (pigeon, starling, sparrow etc). Under the special protection were beneficial insects: ants, bees, spiders, and others. There was even the so called “taboo” towards to them – not to kill. It is said for example: “if you destroy the ant hill, your hands will wither”, “if you kill a spider, your legs will wither” etc.

People have their own proverbs and spells for every case, the outcome of which was impressive.

Consequently careful treatment to nature was in the picture of popular education system. Interdictions and literary instructions were essential ways of education, which kept out of birds, animals and plants from aimless elimination.

The system of education, changing from child development called – “sin”. It is based on compassion, forgiveness, good nature. Responsibility of children before the God was defined by their behavior.

Education system "sin" was the background standard of human behavior. Violations, making an exhibition of society were considered as sin before the God. This system is connected with nature and social life. It appears in nature and made every family ways of life. Common laws of morality, environmental friendliness were based on it.

Taken by teachers-investigators opinion polls among parents and pupils helped to determine the role of family upbringing in development of ecologic culture of pupils on the base of Tatar people ecologic knowledge.

Home flower cultivation was widely held in everyday life of Tatar people. Many songs are about the love to flowers, where praising their beauty.

Learning everyday life of family and peculiarities of Tatars` folk traditions, K. Fuks wrote: "Basil (Ocymum basilikum) is the favorite flower of Tatars, they like the way it smells. Here Tatars set out their windowsills with basils, nasturtiums, balsamine and very rare with other kinds of flowers" [5, 112 p.].

Having no life experience, children try to copy their parents sizing up their behavior and actions. They explain it as follows: "My father set trees like this", "So taught me my mother to pill potatoes". In this regards wrote V.A. Suhomlinskiy: "Family keeps good folk traditions" [3, p. 35]. Tatar folk pedagogy used the example of mother, her image as the effective one in children upbringing. Image of mother, her kindness and fidelity to children is praised in folk art. Creating of Mother`s cult doesn`t only mean to accept her educative role, it means that no one honest man can be brought up without love and respect to mother. As G.N. Volkov puts it: "If the ancestors are about the past, field of beliefs, children are about future, so mother is about the present, and her activity is directed into upbringing of youth generation" [1, p. 304].

Tatar peoples` family life, the way they bring up their children differ and it is affecting in traditions, customs, holidays and everyday life of these people. A child is growing up and developing in native verbal environment, traditions of his nation. Traditions, customs, pedagogic an ecologic experience of people are in every field of life – economic, politic, moral, common, pedagogic, and ecologic culture. They are peculiar to every culturally-geographical regions and tribes.

Komenskiy entered his career as researcher of folk traditions and customs. His pedagogical system was theoretical justification and development of people`s education. Generalizing experience of home nursing, he developed an idea of "Mother`s school".

Pestolazzi I.G. based folk school in native language, using vast experience of Switzerland folk pedagogy.

Ushinskiy K.D. highly respected pedagogical thought of people, their great experience in upbringing and education of coming generation. Putting the aim, character and methods of folk education he made his own conclusions that every nation has its own system of education, upbringing. The main idea of Ushinskiy pedagogical theory and system is upbringing nationality [4, p. 122–225].

Still we can observe elders cult in countryside. And the reason is own houses, property. From the first days of being in this world a child is feeling every beauty of native shores landscapes and put all forces to make it better. That is a good basis for environmental education.

The most pedagogical functions in upbringing of children, teenagers and youth people place on their parents.

Fellowships between members of family and also parent's relationships influence on family education. That is why one of the important factors in Tatar nationality is united family. Only a good atmosphere in family can make a difference in environmental education. "Friendly family lives in blessing, but where there is a quarrel, where the perish is". For education and upbringing of children in Tatar families is responsible head of the family – father. However his way of living gave a little chance to face children at home. The most part of time he spent at work. Trying to pay equal attention to all children, still sons were closer. Parents remembered their responsibilities to bring up a good farmer and breeder. During upbringing father paid a great attention to physical and ecologic education of sons. He familiarized his children with environment during farm labor, grazing of livestock and told about complicated natural phenomena with specific reference.

There are many practices in traditions of education, especially regarding farming and cattle breeding. These knowledge, working out during centuries-long experience help to keep environment in safety. Natural management and environment conservancy fields also included environmental awareness of people about useful plants, palatable grasses and berries and compounding from them medicines. From the very childhood children learned stored by their parents

environmental knowledge. In practice for example they took into account that is forbidden to kill dam and youngster, captured whitebait should be certainly released etc. Tatar people emphasizing great part of father in upbringing said: “In fishing took after father”, “Like father like son”. Etc.

According to Tatar people parents` love is greatest and irreplaceable source of child`s intellectual development, his emotions, morality, confidence. Parent`s love is ever-living source of tenderness, understanding, carefulness, love and other gentries. As wrote A.S. Makarenko: “People brought up without parent`s love are often spavined people” [2, p. 24].

Wise old men – aqsaqals: grandfather and grandmother were respected tutors in Tatar families. Everyone takes their advice; they sit at the head of the table, and invited to settle different disputes. Such respect for elders is explaining by their great experience and deep knowledge. Wiser ones were held in respect not only in their families but also in other families among youths.

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Materials of Conferences

THE EDUCATIONAL PROCESS IN A HIGHER EDUCATIONAL INSTITUTION AS THE PERSONALITY OF THE CITIZEN PATRIOT OF RUSSIA

Abdulaeva P.Z., Osmanova A.A., Magomedova M.A.

Dagestan State Academy of Medicine, Makhachkala, e-mail: patimat1959@mail.ru

Sharp decrease in the society's level of morally-spiritual development brings up a prior task of patriotic education as the factor overcoming negative trends among young people. The authors suggest discussing the problem of patriotic education through teaching and educational process in a higher school of medicine.

In XIX Russia entered the new level of development but inherited plenty of economical, political, social and other kinds of problems from the gone epoch, Great changes took place in morally-spiritual sphere of the life activity of the Russian society. The educational potential of art and culture decreased significantly. The winds of change left a strong impact on the domestic educational system which endured all negative and positive circumstances of the transitional period. As a result patriotism as a socially valued quality lost its significance and its role for youth sharply decreased.

It is generally known that the development of patriotism and love of motherland must be guided since early age within the family and then must develop along with other social institutions when the outlook base of the personality is being founded. The special importance of the coordinated solution to the problem must be emphasized. However the modern realities are such that the society almost completely delegated the power to the educational system thus making the problem more complicated.

Under the present-day circumstances when we speak about the revival of Russia the patriotic education has started playing a main role as a catalyst of the process. The above mentioned point is eloquently testified by a number of state documents having been adopted recently. First of all, it is the State Programme "Patriotic Education of Russian Federation citizens from 2001 to 2005" (approved by the resolution of the Government of the Russian Federation of the February 16, 2001 № 122); the Concept of Patriotic education of the citizens of the Russian Federation (approved by Government Committee on social issues of the military, citizens retired of military service and their family members, minutes № 2(12)-П4 of the May 21, 2003); State Programme "Patriotic education of Russian Federation citizens for 2001–2005" (approved by the resolution of the Government of the Russian Federation of the July 11, 2005, № 422) and others. Besides the programmes of youth patriotic education are adopted on the regional and departmental levels. The common idea of all above-mentioned documents is that their implementation must "promote the maintenance of social stability, restore of national economy, and strengthening of national defense capability" [1]. It is added that "patriotic education is a systematic and purposeful activity of the official bodies and organizations to develop patriotic conscience of citizens, the sense of faith to their motherland, eagerness to fulfill their civic duty and constitutional obligations to defense the interests of the Motherland" [2]. The mentioned documents set the same goal, anyway, this goal is "the development of the system of patriotic education of the citizens of the Russian Federation, the system developing patriotic feelings and consciousness and providing on the base of them the solution to the problems on social consolidation, maintenance of social and economic stability, strengthening the unity and friendship of the peoples of the Russian Federation" [3].

Teaching and upbringing are integral notions. The unity of the process must be formed on the base of rich spiritual and universal cultural traditions of the developing of the patriotism and patterns of international relations. It's for them to play the most important role in social, civic and spiritual moulding of the personality, they give the base to strengthen the love of Motherland, responsibility for its power and independence.

Educational process is one of the main aspects of the patriotic education system in the university. The success of the whole system depends greatly on the process handling. There are no trifles in this handling, it is the application of new educational technologies which is important as well as the close contact with museums, theaters and other cultural offices based on the design and implementation of long lasting programmes. But the focus on world outlook takes a special place, it plays a key role in the moulding of the patriotic personality. In the connection to it the mission of liberal arts is considered greatly significant as it is up to them to play the role of state ideology conductor, to form the proactive life philosophy. To solve the task of patriotic education in the higher school is not impossible. Furthermore it is determined by "State Educational Standard on Higher Professional Education" within the syllabi of the humanitarian disciplines: National History, Philosophy, Cultural Studies, Sociology, Education Science, Political Science.

Thus, the problems of patriotic education are crucially important and vital issues in the system of the upbringing a patriotic citizen, who is eager to devote their activity to Motherland welfare. The partial realization of these issues is possible within

the teaching of Arts in the university with the integral policy of patriotic education in the university provided, along with the creative approach of the academic stuff, reasonable initiative, directed at the motivation of academic and research activity of students.

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DESIGN OF MULTI-DIMENSIONAL MATHEMATICAL TRAINING

[1]Dorofeev A.V., [2]Piadina J.V.

[1]Sterlitamak Branch the Bashkir State University, Sterlitamak, e-mail: an-dor@rambler.ru;
[2]The Western Galilee College, Israel, e-mail: jannap@wgalil.ac.il

The article is dedicated to the substantiation of the systemizing role of the multi dimensionality principle in the design of competence oriented mathematical training in high school. Several modules can be distinguished: theoretical, humanitarian, methodological, application and methodical, on the basis of which cognitive, social-humanitarian, operational, research and professional orientations of mathematical preparation. Multi dimensionality of mathematical training is connected with formation of competence, which is a necessary condition of student's professional development.

One of the major landmarks of social progress in the dynamically unfolding innovative processes in high school is students' readiness for changes, participation in them and accepting the new as a value. The great importance in this case acquires training of a specialist, who owns deep competence in the subject, professional culture and organizing skills. That is why the key aim in modern social and cultural situation is to become a creative personality, which has a wide range of humanistic values.

A future specialist is required to have the ability of thinking hypotheses and assumptions and perceiving the information as practical value for a concrete result. Abilities in the sphere of professional activities should be complemented by social and cognitive abilities, including a student's readiness for creative search and lifelong learning. Knowledge and skills together with behavioral and motivational aspect are components of multi-dimensional cluster structure of competences, according to which professional competence, so necessary for the effective work of a graduate, contain clusters of cognitive and functional competences. Personal competences disintegrate into social and high level competences, and the latter serve as a basis for all other competences acquisition [1, p. 15−18]. Professional education should not aim so much on the formation of a final set of previously known competences, but on the formation of high level competences, which allow a graduate to form abilities to diagnose their level of personal and professional competences.

There are some qualities in competences that can be characterized by such notions as "intersubject", "interdisciplinarity", and "multi dimensionality". Relatively, the process of formation of competencies should be designed on the principle of multi-dimensionality, which implies commensurate individual relationships between the components and changes of pedagogical system for education to be focused on the formation of student abilities to self-diagnose their level of professional development.

The category of "multi dimensionality" and its methodological aspects are developed in philosophy and informatics. Multidimensionality as a characteristic of multiplicity states measurement is presented in the work [2]. Pedagogy that has accumulated considerable experience in the study of educational systems from the perspective of the multidimensionality is not an exception. V.E. Steinberg is developing the theory of multidimensional teaching tools [3]. A.A. Ostapenko bases multidimensional modeling pedagogical reality on matrix structures, including the target, process, system-substantive, instrumental and evaluative invariants [4].

Appealing to the category multidimensionality in philosophical and psycho-pedagogical research shows the need for science to reflect reality by the most adequate and volume characteristics – compared with such characteristic of reflection as "systemic". It is more capacious in relation to close notions of "versatility", "multi-level" and "multi-direction". The context of the category of "multi-direction" shows the quality of "release", while the "multidimensionality" – synthesis of complementary parts, which take the system to a new quality. This is not a mechanical connection of parts, but the selection of the set of characteristics that allow to "measure" state, change and development of the entire system. Multi-level and versatility are close in context to release any levels and facets inside the system. This division implies a certain classification of the system (eg. on the basis of "general-special-individual"), which is also not the same as the concept of multidimensionality.

The principle of "multidimensionality" in the design of mathematical training is associated with the need to focus on its transformative, innovative and predictive activities. That means you need to consider how diverse ways of codification

of theoretical knowledge and the transformation of the educational information in a form suitable for learning by students with different cognitive abilities, and the transformation of teaching methods in intellectual technology of interacting agents – a teacher and a student. Multidimensionality is manifested in the allocation of cognitive operational-activity, social, humanitarian, professional research directions. It is important to rely on both a generalized model of professional development of the student, and the unique identity of the person with certain cognitive abilities. From these positions the following is relevant:

● justification of modular organization implementing cognitive, social humanitarian, research, operational and professional focus on education;

● defining of the functioning of professional training for the formation of high level competences of a student;

● building professionally-oriented technologies aimed at:

1) student learning being able to synthesize subject-realizable solutions, content-technological subject-productive tasks in a simulated and real professional activity;

2) requirement of providing meaningful and motivational impact of learning and cognitive activity in the process of creative solutions of professionally-oriented tasks;

3) developing a criteria for readiness for professional activity and, therefore, appropriate diagnostic methods.

Competence-based approach allows us to consider the content of mathematical training in terms of the result of such integrated result of professional education as high level competences. We cannot, however, consider high level competences as a kind of superstructure above the typical knowledge and skills, which are expressed mostly by intuition, perspicacity and common sense. Multidimensional structure of competences points to three aspects that ultimately affect the formation of high level competences of a future expert: theoretical knowledge, situational behavior and professional behavior style.

Among theoretical knowledge the following is distinguished: declarative (eg. knowledge of facts, concepts and rules); procedural (for example, knowledge about the functioning of the application and functioning of teaching and learning, learning the key to the search for knowledge). Professional behavior of a student is based on their theoretical knowledge. Knowledge quality criteria here are integrative bonds and systematization of knowledge about the position of their usage in the future professional career. Consequently, theoretical knowledge determines an adequate understanding of the essence of student's learning and the process of professional self-development.

But only theoretical knowledge is not enough for the educational process, as a student need to make competent decisions in a variety of professional situations. Numerous complex specific learning situations can not be studied during training in full, so a student must possess situational behavior models, eg. behavioral strategies. This approach involves giving students the opportunity to "try on" the role of an expert for the manifestation of his personal qualities (eg., communication skills, empathy, tolerance, openness), influencing the formation of high level competences, which definitely determine the style of professional behavior.

Cognitive, functional, social competence and professional personality qualities, the most important in the professional development, are integrated in high level competences (eg., communication, creativity, the ability to continuous self-development, social and professional responsibility). Designing multidimensional mathematical training is carried out in theoretical, humanitarian, methodological, and methodical application modules:

Theoretical module (implements cognitive orientation) is focused on the formation of concepts, methods of mathematics and characterizes sufficient level of use of the device in the organization of learning and research student's activity.

Humanitarian module (implements social and humanitarian orientation) is focused on the development of culture and mathematical ideas about the role of mathematics in science knowledge (emphasis in the content of the humanitarian aspects of the discipline, ensuring mutual transitions semiotic-symbolic systems, creating situations of "intellectual difficulties", the impulse to creative activity and communication activities, as well as promoting criticality, initiative and reflection).

Methodology module (implements research orientation) is focused on the development of student's mathematical modeling, deductive and inductive methods of reasoning, verification methods in science.

Application module (implements the operational orientation) is focused on providing the motivation in the work with professionally-oriented tasks, the use of model-shaped illustrations as schemes of theoretical knowledge, methodological specification of the method of modeling and synthesis of the research function of the new theoretical knowledge to develop students' practical skills.

Methodical module (implements professional orientation) is focused on theoretical and methodological simulation training activities required for the optimal combination of the objectives of mathematical training requirements of students' professional education.

Each module is focused on the formation of competences such as information and methodological, social interaction, self-organization and self-management, systemic and independent cognitive activity. In the monograph [5] there is a competence model of mathematical training of students of pedagogical specialities. It presents technological

support of multidimensional mathematical training, which includes:

a) educational activities, contributing to the formation of professional competencies;

b) designing socially significant results of this exploration activity;

c) identification of attitudes results for the student and society.

Conditions necessary for the formation of student's abilities for independent cognitive activity mastering basic knowledge and skills sufficient for effective use in a future profession, are:

1) modernization of methodical teaching systems based on the competence approach;

2) ensuring inter-linkages of formal logical and intuitive components of learning activities.

We will take a closer look at the interactions of formal logic and intuitive components of the activity.

Formal, logical component is reduced to a set of objects to classify skills and deductive reasoning, counterexample to disprove a general statement, formulate questions, conduct action by the algorithm and make this algorithm, and look for patterns to get the consequencies. While intuitive visual component involves guessing patterns in numerical material and geometric drawings, expressing hypotheses and holding reasoning by analogy and induction, building generalizations and instantiations.

Conclusion. Implementation of cognitive, social, humanitarian, operational, research and professional orientation education involves enriching personal experience of the student in the areas of:

– intellectual and cognitive search, if converted quest for knowledge, endowed with personal meaning;

– dialogic communicative activities, if any leads to the formation of their own position in life testing;

– emotional and personal manifestations, if there is a need to develop and experience different aspects of the value of action relations.

Thus, the multi-dimensionality of mathematical training in the integration of methodological knowledge and generalized methods of activity focused on the formation of a student's ability to self-education professional self-development

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ORGANIZATION OF ECOLOGICAL ACTIVITY OF JUNIOR SCHOOL CHILDREN

Glazyrina N.L.

SI "Gymnasium № 2", Rudny,
e-mail: PashevitchNatali@mail.ru

The article describes the importance of using different types of ecological activity in the formation of ecological culture of JUNIOR SCHOOL CHILDREN. In this direction we tudied the experience of other authors. The publication acquaints readers with such activities as: ecological actions, ecological pathway, excursions, ecological games, role plays, field workshops, sociological studies, ecological experiments.

The organization of ecological activity of junior schoolchildren often causes serious difficulties for teachers. Unlike adults, senior pupils and even teenagers, junior schoolchildren look at the world as through a magnifying glass, which not only enlarges the natural objects, but also animates and humanizes them. That is why it is important to take care of the organization of activity even not so significant for the environment, but it has a huge impact on the development of ecological culture of the child [2, p. 21–22].

It was studied methodical development programs of A.A. Pleshakov, I.A. Kudinov, G.V. Bukowski, M.E. Bukovsky, N.F. Vinogradov, G.G. Ivchenkov, I.V. Potapov, N.S. Dezhnikovoy, L.Y. Ivanov, E.M. Klemyashova, L.M. Klara, A.P. Molodov, V.A. Samkov, V.M. Suvorov, N.V. Lobodin, Y.N. Alexandrov, N.D. Laskin, N.V. Nikolaev, S.V. Mashkov, I.G. Norenko and others. In their studies the authors used the following forms: excursions and activities, studies and projects, practical and laboratory work, observations and walks, distance travel and tours, competitions and children's parties, work in pairs and groups, ecological quizzes and KVNs (the club of inventive gays – CIG), conversations and exhibitions, presentations (using computer technologies) and ecological operations, ecological pathway, an hour of questions and answers, ecological courts, etc.

The analysis of researches allowed to group conditionally activity forms as follows:

– Ecological-oriented: ecological and psychological trainings, festivals, discussions, naturalistic activities, environmental, business, simulation games, thematic shifts in the CHC (Children's Health Camp);

– Environmental: community work days, ecological actions, children's ecological movement, actions on environment protection, tree planting;

– Design and research: ecological workshops, competitions, creative collective works (CCW), summer ecological workshop, the establishment of environmental projects (Urban ecology, recycling, the projects of ecologically clean house), and field of environmental practice;

– Educations: studies, environmental monitoring, meetings, the issue of ecological paper, school of the young journalist, theatrical events;

– Eco-regional: excursions, expeditions, journeys, educational ecological pathways and others [3, p. 125].

We will describe some of the offered forms.

The ecological actions. Children offered some actions, among which was "Help to homeless dogs" which included the steps to search the owners for the homeless or lost dogs. Participation in the actions which are carried out by International Fund for Animal Welfare IFAW became traditional. An example is the participation in the action "Save the elephants on the planet" (students gathered 526 signatures under the petition, involving to this noble cause their friends, parents and students from other schools).

Conducting of ecological action "The Week of Clean Schools" suggests improvement of ecological situation of schools, improving of ecological education of schoolchildren, as well as the assessment of practical and educational work of ecological character, which are held by teaching staff and students of schools.

At the first stage of the contest the organizers organize "The Round tables" with children of school government in each of the districts where explains the basic criteria and conditions of the tender. After meetings with leaders in all selected schools are hanged announcements that specify criteria for determining winners. Then all schools receive a week's time to improve the ecological condition of the school and other activities on the competition conditions.

During the competition, the competent jury, which includes adults and children, conducts the monitoring of ecological conditions in schools, school gardening degree and the frequency of the community work days, which are held in schools.

Are also conducted interviews with students to determine how students are informed about environmental issues. According to the results of monitoring and conversations is determined the school – winner.

Excursions. The important information about the nature of a child can get in the school yard in nearby squares and parks, even on a busy city street, if the excursion planned and prepared in advance. In preparing and conducting the excursions the facilitator should follow some rules:

– the duration of the excursions for children 6–8 years must not exceed 30–40 minutes;

– The place of the excursion must be new for the guys (but not the head), as the novelty of perception helps to better learn the material;

– The manager must determine in advance the route of the excursion to identify interesting stopping places and objects for display. There are 3–6 objects for children of this age;

– it is necessary to concentrate the attention of the children to the planned objects, not being distracted by minor and accidental, strictly following the route and the theme of the excursion;

– The explanations need to carry an emotional charge and be rather brief, do not overwork sightseers;

– Each object for better absorption is shown on the excursion 2–3 times in different ways. For example, showing Gladiolus, at first are introduced with the name of the flower and its features, and then, in another place, ask to find a flower, like a sword, tell the legend about him, again is repeated the name.

– Each object for better absorption of the shows on the tour 2–3 times in different ways. For example, by showing gladiolus, the teacher introduces the name of the flower and its features, then, in another place, asks to find the flower, like a sword, and tells a legend about it, the children again repeat the name. At the third stop we guess riddles about flowers, including about gladiolus;

– For the aesthetic perception of the nature the excursion is desirable to accompany with reading of passages of poetry, available for this age, guessing riddles, bringing the folk proverbs and sayings;

– Fastening materials of excursions can be carried on the following excursion, walks and various games [4, p. 4]

Environmental Games. Game is, first of all, the accumulation of experience, and it is active experience. The method of game in general terms is a sequence of actions, operations of the teacher on the selection, development, preparation of games, the inclusion of children in play activities, the implementation of the game, summarizing its results [12, p. 30].

Environmental games, chosen appropriately, help teachers to give children the installation on the right behavior in the nature among peers and in the circle of adults, to form the corresponding emotional attitude to such behavior. The tasks of the game and game situations are as follows: to develop the environmental culture of junior school children; to teach children to use the knowledge about nature in the fulfillment of the tasks, i.e. to enhance the knowledge acquired before the game, activate thinking of the child; to reinforce knowledge of the nature; to develop ingenuity during the game; to develop observation when performing gaming techniques. In some cases, in the game, some information is digested, which increases the volume of knowledge about the nature of [4, p. 32].

A role-playing game simulates various life situations, giving students the opportunity to understand better the studied laws, communication, relationships. There are some the types of the role-playing games such as are environmental talk

show and environmental performances. However, the talk shows are difficult for organizations with primary school age. Therefore, during the work with junior school children we use environmental l performances which in form are freer.

Both teachers and students are given more opportunities to express an invention, personalized every role. In this case, the success of the performance is largely determined by the contrived costumes, and even the choice of artist in a particular role. There are many elements of humor in scenarios of environmental performances. With good production the hall should periodically laugh. Children love to compete, so it is logical to conclude any event with quiz, crossword, Olympiads, etc [8, p. 5–6].

A Field workshop is an indispensable element of the program for the development of ecological culture of the junior school children. They allow organizing the purposeful activity of junior school children study, assessment and improvement of the natural and social environment. The objects of study are variety of similar ecosystems and socio-eco-systems and their separate elements. Performed by junior school children learning research activity is aimed at improving skills of ecological character, emotional and aesthetic development, the realization of the need to solve environmental problems, the willingness to participate personally in this process. The main task of the workshops is in real conditions of interaction with the environment to reveal the universal value of nature, to form a basis of ecologically reasonable behavior [12, p. 32].

Our children are urban children. They have been in zoos and botanical gardens, but, as a rule, can't distinguish a linden from a pine, and a starling from a sparrow. Moreover, there is an opening for them how many different species live (grow, fly, crawl) next to them [7, p. 62]. Younger students are introduced to the real structure of natural communities (steppe, meadow, forest), learn how to use qualifiers.

The themes of field workshops can be such: "Live pharmacy: medicinal plants at home (Park, meadows, forests, etc.)", "Study of snow cover of the district" [6, p. 54–55], "Winter mnogosleditsa" [8, p. 80–86], "Distinguish spring trees", "Inhabitants of the river Tobol" and other.

The tracking processes in natural anthropogenic systems (monitoring) gives a real reliable information, in which students can identify local environmental problems, to continue to deploy all possible efforts to eliminate them [11, p. 382].

Sociological researches constitute a special category of tasks (questioning – written and oral interrogations, interviews, etc.), which directed on the defining the relationships of reference groups to the specific aspects of the environmental problems. Any sociological interrogation conducted for a specific purpose and, as a rule, is a part of a lot of work (research or project).

Sociological research includes the main stages of work: writing of the questionnaires, their reproduction; distribution of questionnaires by the principle of feedback; carrying out sociological interrogation; analysis of results; receiving conclusions; interpretation of conclusions.

The questionnaire is desirable to formulate a "intricately" so that the respondent could not predict what answer you expect from him. It is desirable to develop simple, elementary "key" to sociological poll for simplicity of processing. It is possible to appropriate to answers points; for example, to the affirmative answer are appropriated 2 points, negative – 0, to the answer "not always" – 1 point [7, p. 65].

Ecological experiments. People are exploring the nature many thousands of years. But it is not so simple. Take, for example, the ice drift. Observing for this natural phenomenon, we note that there are different ice floes on the river: bright and dark. Which of them will melt faster? Do we observe? Uncomfortable and it will take a long time. We can spend an experience. It can be delivered only to those spring days when the sun peeks through the window. It is necessary to prepare a sheet of paper, half of which is shaded in black paint. Put the list on the window-sill, well-lit by the sun. Let the paper will lie down for half an hour. After half an hour should be touched by fingers, first, to the bright side of the page, and then to the dark and find out what part of the sheet has warmed more [5, p. 41].

Early spring away from the path on a flat snow it is necessary to outline three equal-sized book platforms. One sprinkles with powdered coal or ashes, the second – sawdust. The third area will serve for comparison. Every two days should be spent observing. Their purpose is to find out under which "cover" the snow melts faster. In this experiment very interesting to first think and would assume, write it in the diary of observations and then compare with the results of the experiment [5, p. 41].

The forms and methods of the organization of the ecological activity of junior schoolchildren, which are described in this article, demand thorough preparations from the teacher. Only in this case they will be effective and leave a trace in soul of the young inhabitant of our beautiful planet Earth.

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USING OF CALORIMETERS FOR MEASUREMENT OF ACCUMULATED ENERGY BY CRYSTALS IONS DURING IRRADIATION

Abdula J., Tokzhigitov K., Galaguzova T.A.

Taraz Innovation and Humanitarian University, Taraz, e-mail: tamara5024@mail.ru

Radiation breaches appearing during the interaction of radiation with any hard body cause the change of its properties. The accumulated energy can be determined by changing the heat of a combustion or dissolution on changing its heat-conductivity and parameters of the crystalline lattice. The most wide-spread determination method of the accumulated energy value is the method of annealing. The variety of this method is the method of the differential-thermal analysis (DTA). The method of the differential and thermal analysis are used researcher at study of the hidden energy in alkaline crystals. The purpose of our investigations was to determine whether there is an indicated dependence for another group of ion crystals different from alkaline of the types of the crystalline lattice.

Keywords: irradiation, energy, ionic, crystal, lattices, differential, thermal, analisis, installation

Radiation breaches appearing during the interaction of radiation with any hard body cause the change of its properties. The degree of radiation breaches herewith can be evaluated after changing its determined properties. However such properties may be defective since only definite types of defects are often responsible for the change of that or another property of a hard body.

To form any defect a determined share of the radiation energy is spent. That is why any irradiated body possesses some additional free energy which is accepted to name “accumulated”. The last is the fullest characteristic of the irradiated material state as it itself defines the total breaches which are preserved after the cessation of the radiation action.

The accumulated energy can be determined by changing the heat of a combustion or dissolution on changing its heat-conductivity and parameters of the crystalline lattice [1]. The enumerated methods differ either by their big difficulty or by having some defects and because of that they didn’t get proper spreading.

The most wide-spread determination method of the accumulated energy value is the method of annealing. Its essence is that while heating the irradiated crystal the thermal activation of defects occurs and it is accompanied by annihilation and emitting some energy.

The variety of this method is the method of the differential-thermal analysis (DTA). It is necessary to mention that this method DTA is founded on the measurement of the temperature differences between the standard and the investigated sample $(T_e - T_1)$ and on the measurement of delaying temperature growth (increase) of the sample concerning the temperature of a calorimeter block $(T_e - T_1)$ [1, 2].

Herewith the value of the energy in the temperature interval from τ_0 to τ is calculated according to the formula

$$Q = \int_{\tau_0}^{\tau} \frac{mc(T_2 - T_1)}{(T_e - T)_1} d\tau \left(\frac{J}{kg}\right),$$

where m – sample mass; c – specific heat-capacity of J/g sample.

The full value of the accumulated energy is determined as the difference of the first and second heating of samples in the identical condition. Herewith in the process of the first heating there occurs emitting of the accumulated energy and in the second process there determined the background which is caused not by identification geometry of compared samples and by the difference of their thermal ties with the calorimeter block.

The method of the differential and thermal analysis are used researcher at study of the hidden energy to deformation in metal [1, 3] accumulated energy during the irradiation on graphics [2], in metals [2, 3], carbide-calcium, diamond [1] and in alkaline crystals [2].

The applied calorimeters for measuring accumulated energy according to the DTA method in principal identical. The difference exists only in constructive performance.

We assembled the calorimeter installation for measurement of accumulated energy according to method DTA, which consists of calorimeter itself, block for measurement, system of the vacuum and system of the heating.

The calorimetric installation allows:

– to measure the difference of $(T_e - T_1)$ temperature with an inaccuracy to $4{,}3 \cdot 10^{-3}$ degrees;

– to conduct heating of the calorimeter according to the linear law at 1,5 degree per minute velocity in the interval of temperatures from the room temperature to 600 °C and to reproduce heating with ±5 degrees inaccuracy;

– to measure thermal effects with more than 0,5 *J*/*g* with 15 % inaccuracy;

– to reduce to a minimum the temperature oscillation in the calorimeter because of convectional flow using vacuum.

The investigations conducted in Tomsk Polytechnical Institute determined natural ties of changing the properties by the action of radiation abreast these materials from their chemical composition [1, 2]. Abreast ATC there are more defects in the combination (junction) with great energy of the lattice after the irradiation and consequently the change of their properties are more considerable than in the crystals with weak ion ties in the lattice.

The value of the accumulated energy is bigger in the combination with great energy of the lattice for ATC [2, 3].

The purpose of our investigations was to determine whether there is an indicated dependence for another group of ion crystals different from alkaline of the types of the crystalline lattice.

We have chosen the accumulated energy as a characteristic of the radiation breach degree (Fig. 1).

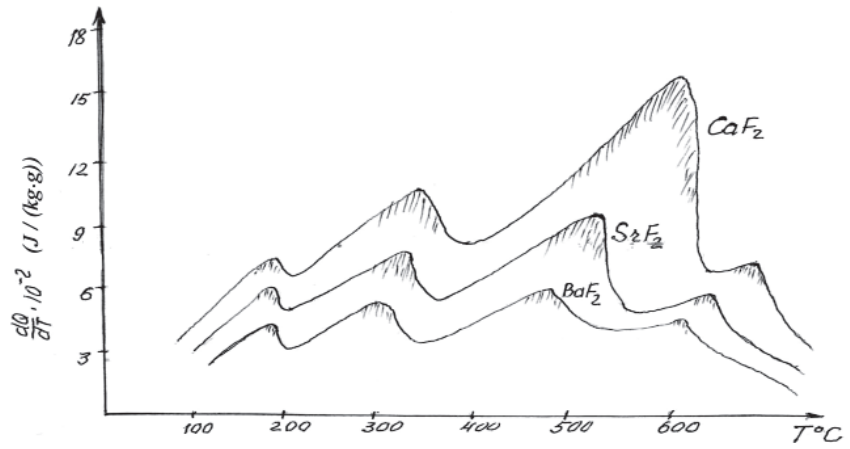

Fig. 1

The Drawing one shows the velocity dependency of emitting the accumulated energy on the temperature for crystals CaF_2, SrF_2, BaF_2 which are irradiated by the identical absorbed dose of γ-ray. The areas limited by curved $\frac{dQ}{dT}$ determine the radiation energy accumulated by crystals.

The radiation energy accumulated in CaF_2 material with great energy of the lattice abreast fluoride is more. It is 6,8 *J*/*g*, SrF_2 is 2,7 *J*/*g*, BaF_2 = 0,9 *J*/*g*.

The concentration of the defects calculated according to an analogy with alkaline-gallic crystals [2] to the value of the accumulated energy and width of the forbidden crystal zone is in $CaF_2 = 10\cdot10^{18}$ sm^{-3}, $SrF_2 = 5{,}8\cdot10^{18}$ sm^{-3}, $BaF_2 = 2{,}3\cdot10^{18}$ sm^{-3}.

The large concentration of CaF_2 defects testifies to more considerable breaches of its crystalline lattice than other crystals which in their turn are accompanied by more powerful change of CaF_2 characteristics under the action of micro hardness radiation of accumulated light sums of the optic absorption.

The emitting spectrums of the accumulated energy in CaF_2 crystals irradiated by γ-rays and others are analogous. It testifies to the analogy of defects created by the radiation in materials which have the same type of the crystalline lattice. At the same time the peak of the accumulated energy emitting in CaF_2 accounts for more high temperatures than others. Full emitting of the accumulated energy (consequently annealing of radiation breaches) in CaF_2 stops in areas with higher temperature.

The dependence of the accumulated energy on the absorbed dose of γ-rays is given (shown) in drawing.

The kinetics of the accumulated energy dependent on the absorbed dose for all three crystals has two staged character. During the first stage we can notice quick increase of the accumulated energy, herewith the velocity of the accumulated energy is the most considerable for CaF_2 and it decreases during the transition from calcium BaF_2. On the second stage there is a tendency of the accumulated energy to saturation.

The quick growth of the accumulated energy on the first stage is caused by the predominance of the process of defect generation over radiation and thermal annealing. The outlet of the accumulated energy for saturation is caused obviously by achieving the dose of radiation of the top concentration of defects beginning with which there is (arranged) a dynamic balance between the number of generated and annihilated defects. The outlet of the accumulated energy for saturation means that the whole energy of the radiation transferred to crystals is completely transformed into other types of energy: light (luminescence), thermal (crystal warming up), chemical (formation of radiolysis products).

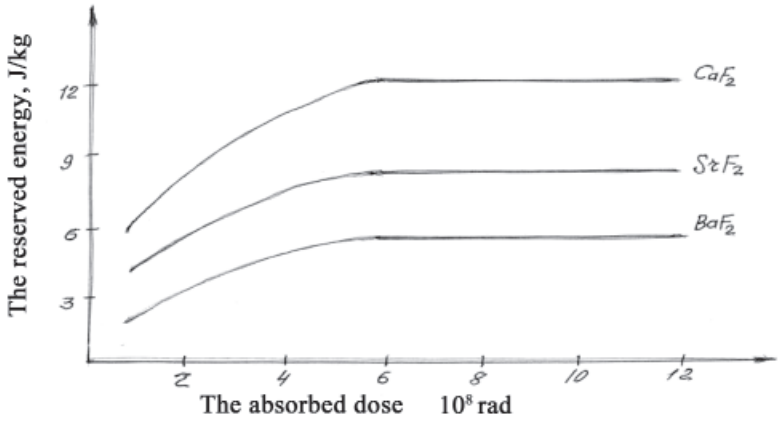

Fig. 2

The Value of the accumulated energy allows to determining its share in the whole absorbed radiation energy by crystals that is to determine the effectiveness of the energy accumulation. The accumulated energy increases with growing the dose of the absorbed energy. How ever the attitude of the accumulated energy to the absorbed one decreases that is the efficiency of the energy accumulation of crystal radiation decreases. In big absorbed doses (10^8 radiant's and more) the accumulated energy makes up tenth percent for CaF_2 and SrF_2 hundredth percent for BaF_2 of the energy absorbed by crystals, that is 99 percent of the energy is spent uselessly.

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NEW INFORMATION TECHNOLOGIES IN TEACHING PROCESS, CREATION OF INTERACTIVE ELECTRONIC TEXTBOOK

Ayazbaev T.L.

Taraz Innovation and Humanitarian University, Taraz, e-mail: tamara5024@mail.ru

When elaborating electronic textbook (ET) it is necessary to take into account its using during the computer lesson. Hence there arises a problem of succession construction of the computer lesson from the point of view in searching the optimum number of fragments of the program (stills of the course) which is necessary to give to a student and how many questions to ask him while giving an account of theoretical material. The basic principle of solving this problem is the principle of interactivity of ET. To be an interactive electronic textbook it must work for acceptance and keeping (information data of marks and rising the level of difficulty). For example, if the mark is "2" it is necessary to deepen testing and ask deeper questions on the previous subject.

Keywords: elaboration of the electronic textbook (ET), succession of the computer lesson is the basic principle of interactivity ET, of interactive electronic textbook

The modern period of the development of the society characterizes the informatization of all spheres of human activity. This process cannot avoid the pedagogical sphere which brought about the appearance of the term "new information technologies of education" in the theory of training. There are some definitions of the information technology of education. The term "information technology" was introduced by V.M. Glushkov. He defined "information technologies – as the process connected with information processing" [1]. The educational process is also connected with transference and processing in which information is transferred from a teacher to a pupil. The information processed by a pupil is converted into knowledge.

While increasing the volume of information which is necessary for mastering educational discipline there sharply arises the question of efficiency of its transference, organization of maximum activity of students' perception as well as methods and means promoting to increase the creative interest to the discipline which they study. The use of the computer technology in educational process allows to change the dataware of the last one. Under modern interpretation of this notion the information technology of education is understood as the totality of methods, forms and ways of organization of education process using computer technology for training. The use of computers both for information transference and for supporting the active creative process of its perception by students is the basis of information technology education. In other words, the information technology of education is the process of preparation and information transference to students the means of which is a computer. A computer can promote the development of a person's cognitive need transferring such knowledge to a person who cannot get it without its help but it can give him powerful stimulus for developing external prestigious motivation.

Can a computer promote the development of creative thinking? Certainly can. However it is necessary to formulate clearly the purpose of training (education) by using a computer, to check whether the purpose is achieved and by maximum using psychological knowledge of ways and means to achieve this purpose. Laboratory experiments show that under conditions of using computers including the direction of a person's cognitive activity one can achieve higher factors of a person's creative activity than under traditional conditions [2].

The essence of psychological and pedagogical problems of educational informatization in our opinion consists of understanding what possibilities information technologies possess by improving the process of training and how to include them in the structure of pedagogical activity in order to solve pedagogical problems more effectively and how to the best advantage to combine a person and a machine in complex man-machine system of education and what theories of mastering knowledge and psychological mechanisms of training must be used in order such system functioned effectively [3].

The realization of information technologies in (training) educational process takes place by using its definite toolbox which has got the name "means of new information technology". Under it one ought to understand "program and apparatus means and devices functioning on the basis of microprocessor computing machinery".

Among the means of information technology indicated above the packages of applied educational programs are the most important ones. They have got the name "applied software programs".

The methodical purpose of applied software (educational programs) is conditioned (caused) by need of intensification of educational process and by transferring it to a higher level.

Requirements to applied educational programs (AEP) are considered from different points of view.

New methods of training (education), founded on active and independent forms of acquiring knowledge and work with information displace the methods of traditional education which are founded on collective perception of information. At the same time we have the process of using applied educational programs to support traditional methods of education (training). Applied software (applied educational programs) used for teaching (educational) purpose are transferred some training functions, consequently each program must be designed in accordance with didactic principles of education (training) which determine requirements to AEP. It is known that teaching method of each educational subject in its turn takes into consideration (accounts) originality and peculiarities of the corresponding science, and so it is legal to speak about methodical requirements to applied software which foresee specifics and originality of each concrete science and its corresponding educational subject. Determining (defining) pedagogical requirements to applied software (AS) it is necessary to provide checking pedagogical efficiency using AS.

On the basis of analysis of requirements to AS we can draw a conclusion that by elaborating the software it is necessary to pay great attention to the educational technology being used was adequate to processes of mastering this information by a learner. It is necessary to remember that combined models of presenting material enlarge the depth of information processing in the learner's brain and in this way they provide educational efficiency of training. But superfluous detailization of presenting attracts unnecessary information for the given subject (theme) which a student possesses. It prevents him from mastering it.

When elaborating AS (applied software) it is necessary to take into account its using during the computer lesson. Hence there arises a problem of succession construction of the computer lesson from the point of view in searching the optimum number of fragments of the program (stills of the course) which is necessary to give to a student and how many questions to ask him while giving an account of theoretical material. In AS this problem must be solved (realized) as checking which includes organizing well-timed help to a learner when some difficulties arise working with educational material. The basic principle of solving this problem is the principle of AS interactivity which is determined by the following factors:

a) to allow a learner to define the succession of a lesson when the contents is well known or there are some insignificant difficulties in understanding; to provide the direction of a learner (if he ch00ses checking there must be strict direction on the part of the program;

b) to use structures (designs) of educational programs adaptable to individual particularities and need as alternative to linear structure;

c) to provide the receptivity of branching to presentation educational information to questions and examples given to every learner as well as for accounting time to demonstrate educational material necessary for each learner individually. For example, the learner who made a great number of mistakes answering the questions needs not more questions but simply more time for reading and thinking over this educational material.

Software programs created on the basis of multimedia and hypermedia technology have recently got the name of an electronic textbook [4].

Distance education developing for the last years where the system of telecommunication service is used has brought about the appearance of the term "electronic textbook" (ET) and its considerable expansion of understanding each computer training system as an electronic book. Electronic textbooks more often shape up hypertext which presents itself as a complex of information, graphic, methodical and software program of automated education on a concrete discipline based on a personal computer. Such textbook includes six components as minimum: dataware (hypertext with graphic illustrations of the educational material and album of dynamic drawings; a package students, checking, imitating and other dialogue programs for checking; software (the methodical instructions for laboratory practical work); the system software of the electronic textbook for integration of the rest components into the united system and give a user required service. The information is extracted from the textbook by means of interactive searching method.

To be an interactive textbook it must work for acceptance and keeping data (information of marks and to rise the level of difficulties). For example, if the mark is "2" one must deepen testing and ask deeper questions on the previous subject.

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CHOICE OF FREQUENCY OF AN ALTERNATING CURRENT FOR ELECTRIC TRACTION MOTORS, AND FOR LONG DISTANCE POWER TRANSMISSIONS

Dubas L.G.

RICHN RAAS, e-mail: sudarih@gmail.com

Some version of railway power supply system with frequency of an alternating current ≈ 10 Hz is offered. The potential risk for health of the person, connected with probable adverse influence of electromagnetic fields, possibly, thanks to symmetry, can be optimum.

In some countries of Europe: Sweden, Austria, Norway, Germany, and Switzerland – for railways power supply systems wide references have been received by system of AC power with semiconductor converters [1]. The Railway is electrified by an alternating voltage = 15 ± 4 kV with frequency of F/3, where F = 50 Hz frequency on an alternating current of industrial electrification.

The railways power supply system of the reduced frequency possesses advantages. Degree of asymmetry of three-phase currents in industrial electric power system has reduced oneself. Also degree of asymmetry of thermal heating of three-phase symmetric electric circuit has decreases.

Trains can restore also energy, when braking, and are then power sources. Lack of subject is connected by electromagnetic influence on biorhythms of the person and therefore it is desirable to change the frequencies ratio of transformation, for example *F*/5 (if *F* = 50 Hz) or F/6 (if *F* = 60 Hz).

Frequency of an alternating current for electric traction motors and for converters of three phases to one phase is equal in this example ≈ 10 Hz that is out of biorhythms of the person.

At use of two-way road the second phase with frequency ≈ 10 Hz for the electric traction motors which is perpendicular in relation to the first phase of a direct way is on the way back used.

Therefore on this special frequency of an alternating current ≈ 9,8 ± 0,4 Hz the long distance power transmission with four symmetric phases, for example with some voltage ≥ 35 kV, can work.

The power transmission at semiconductor converters with effective voltage ≈ 14 ± 4 kV in fully symmetric scheme on frequency ≈ 9,8 ± 0,4 Hz, possibly, do not influence health of the person.

Worldwide transport systems of electrification differ from other systems of transfer of the electric power. Mainly it is with possibility of regeneration of an electric current when electric trains can be at braking action as electric power sources. The potential risk for health of the person, connected with probable adverse influence of electromagnetic fields, besides is possible.

The choice for frequency of an alternating current for electric traction motors, and for long distance power transmissions with a safe principle of an electric power distribution can be optimum.

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WHAT IS THE QUESTION? HOW RAT UTERINE CERVICAL SPHINCTER LEYOMYOCYTES CHANGE IN PREGNANCY AND CHILDBIRTH?

[1]Grigorjeva J.V., [1]Chemidronov S.N., [2]Renz N.A., [2]Bormotov A.V., [2]Garifullina K.F.

[1]Samara State Medical University of the Ministry of Health of the Russian Federation, Samara, e-mail: JuliaG.va@yandex.ru, gfrs@inbox.ru;
[2]Clinical Hospital № 5, Togliatti, e-mail: kadriya-garif@yandex.ru

Cervical sphincter morphological examination using optical, phase-contrast and scanning electron microscopy shows a number of reactive changes among different leyomyocytes populations. Bright hypertrophied myocytes and small myocytes were found in the inner myometrium layer before and during the vaginal birth. The number of special purpose organelles is reduced. Also, the development of granular endoplasmic reticulum is enhanced in the smooth muscle cell cytoplasm. There are two processes which occurred synchronously during the childbirth: first is – intercellular substance synthesis, second is – the myocyte cytoplasm dispose.

Introduction. The mammal uterus is a unique organ, which adapted to significant morphological and functional changes [5, 6]. Well known, the main functions of the uterus are carried out through the myometrium myocytes activities [3, 4], those fact is still poorly known. The cervix sphincter structure and functioning are the most controversial facts [2, 6]. First, the cervix is a barrier to ascending infection [4], second – it provides the fetus retention in the uterus during pregnancy, at last, during childbirth, it`s a biomechanical basis of cervical dilation [1, 5, 6].

The purpose of our research is to investigate the cervix sphincter muscle cells reactive changes during late pregnancy and natural delivery childbirth.

Challenges of achieving are the following:

1. To study the lower uterine segment structural changes during late pregnancy and childbirth;
2. To determine the myocyte morphological features arising in "maturation" of the cervix during the childbirth.

Material and methods. We have used 25 rats, in accordance with the "Ethical guidelines of the experiments using experimental animals". The object of experiment was been the adult rats uterus during natural delivery childbirth. We investigated 20 and 21 days of pregnancy uteruses first, and uteruses during birth after. Intact uteruses were used as an experimental control. We used the methods of optical microscopy, phase contrast microscopy and electron microscopy. For optical microscopy, the material was fixed in buffered formalin, after it was prepared in a vacuum Leica ASP300 smart tissue processor. Than material was poured with paraffin "Histomix" Bio Optica. Frontal, sagittal and transverse sections were prepared on a rotary microtome thickness of 6 microns. Finished sections were stained with hematoxylin and eosin. We used monoclonal antibodies to smooth muscle actin in IHC (Immunohistochemistry). The antibodies typing were performed with using DACO antibodies in IHC research. To perform phase contrast microscopy and scan electron microscopy the material was fixed in 2,5 % glutaraldehyde 0,1 M phosphate buffered pH 7,4.Then the material was placed in 1 % solution of osmium tetroxide. After this the material was washed with phosphate buffer solution and dehydrated in alcohols of increasing concentration and embedded in Epon-araldite mixture. The preparations were contrasted with uranyl acetate and lead citrate, and then we prepared semi-thin sections were cut 1–2 micron thick and ultra-thin sections of 200–500 nm. The materials were investigated and photographed with an electron microscope JEOL JEM-1400 PLUS.

Results and discussion. We found that at birth the rat cervix wall undergoes softening and thickening in contrast to the body and the uterine horns, which are contrary thinner. The changes in uterus were caused by reactive changes of muscle tissues and extracellular substances.

The size differences in myocyte population were detected during pregnancy and reached a maximum at childbirth. Myocyte size increased during pregnancy. The myocytes with 29,48 ± 4,23 microns length and 9,69 ± 2,74 microns wide were dominated during late pregnancy. The lower uterine segment myometrium myocytes have spindle-shaped form with 19,79 ± 4,62 microns length and 3,75 ± 1,27 microns wide. This fact indicates small leyomyocytes presence in cervix sphincter. These cells are regarded as poorly differentiated in literature.

Via electron microscopy there were defined dark and light smooth myocytes, which were integrated into a single system in mature nulliparous rat's cervix. These cells were contacted with each other by no specialized simple contacts, desmosomes and slit contacts.

The number of contacts is increased during pregnancy. At birth the diametric opposite reaction is observed in sphincter myometrium inner layer. The myocytes are isolated and rounded, cell separation occurs (Fig. 1). The cell membrane forms folds – cytoplasmic protrusions (clasmatosis), followed by cell cytoplasm separation – clasmacytosis (Fig. 2). The number of special purpose organelles reduces. The granular endoplasmic reticulum is changed. Myocyte protein-synthesizing apparatus

is presented with numerous ribosomes, collected in the outlet, which composed clasmatosis.

There is an euchromatin predominance with 1–2 nucleoli presence in light cell nuclei. Predominant population by the end of pregnancy and childbirth are bright myocytes. This fact means the myocytes phenotypic transformation to secretory type. At birth cell death is not observed.

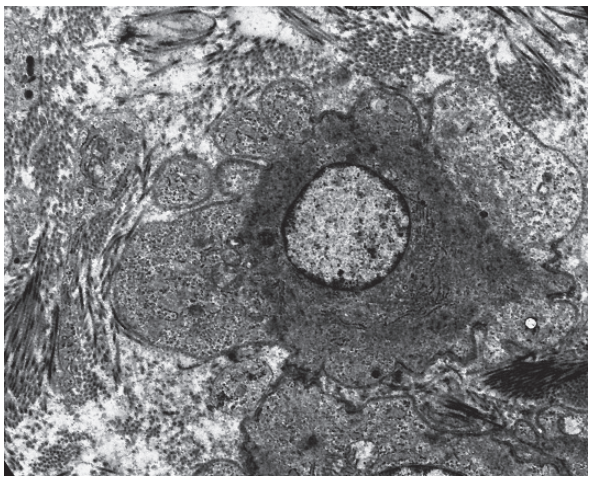

Fig. 1

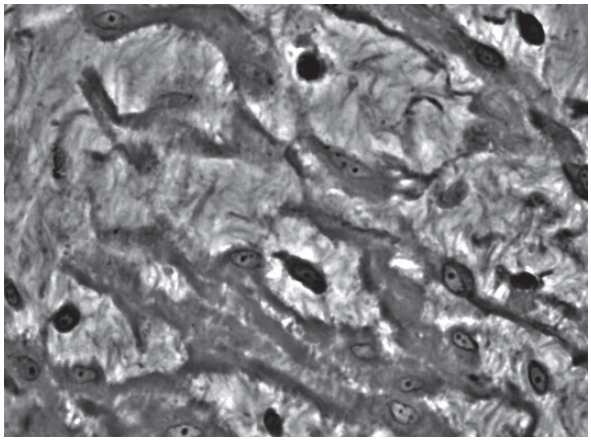

Fig. 2

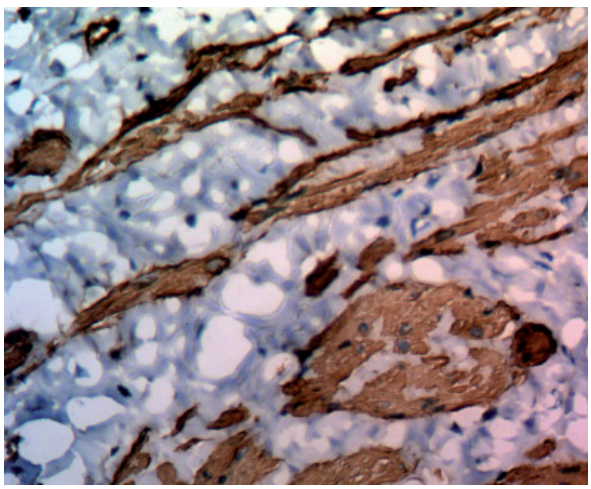

Fig. 3

We can identify leyomyocytes and interstitial matrix increase after using monoclonal antibodies to smooth muscle actin (Fig. 3). The intercellular substance changes in childbirth are one of the most important morphological aspects of cervix "maturation".

Conclusion. We found that during late pregnancy and vaginal birth in myometrium inner layer bright and hypertrophied small myocytes were dominated. Reactive changes in sphincter cervical cells during late pregnancy and childbirth can be regarded as a variant of differentiation and cell specialization. Clasmacytosis phenomenon, detectable during childbirth contributes to changing the qualitative and quantitative composition of the intercellular substance. It prepares the cervix for childbirth and also myocytes cytoplasm utilization during postmature involution.

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INFLUENCE OF SELENIT OF SODIUM ON PHYSICAL EFFICIENCY OF RATS IN THE CONDITIONS OF INTENSIVE PHYSICAL ACTIVITIES

Kornyakova V.V.

Omsk State Medical Academy, Omsk, e-mail: bbk_2007@inbox.ru

The intensive physical activities (PA), having accompanied the sports activities, are usually being led to the fatigue and sharp decline further development in performance. So, it is expected, that the sodium selenite use, the antioxidant properties of which have already been shown by us earlier at IA (Kornyakova V.V., Konvay V.D., 2013), can be increased the intensive physical activities (PA).

The PA have already been modeled on the male albino rats, by the forced swimming test method with the 10 % load of the body weight (e.g. Kornyakova V.V., and et.al., 2007). Then, the rats' swimming has been conducted in the 60 cm deep special pool, and with the 28–30 °C water temperature in it. Thus, the three main groups have already been examined: the first one – to the optimal mode PA (OA), having swum with the load every other day during the five weeks (e.g. 35 days) of the experiment, the second one – with the PA (IA), intensive regime, having swam with the load during the first three weeks (e.g. 21 days) of the experiment in a day, and the last two weeks (e.g. 14 days) – every day, the third one (IA + C) – swam by the IA scheme, in the last week of the experiment personally received orally sodium selenite at the 30 mkg/kg body weight before their swimming. They, moreover, have measured the rats' swimming time, jumping numbers, then they have recorded the electrocardiogram (ECG) at the end of the experiment.

In addition, it has been found, that rats, having subjected to the forced swimming with the load in the IA + C mode, have been characterized by the increased PA, and the cardiovascular system adaptivity to the PA, in comparison with the IA group animals. Thus, the rats' swimming time of the IA + C is practically higher up to 116,9 % (e.g. P = 0,001), and the jumping number – by 110,0 % (e.g. P = 0,009), in comparison with the IA group animals. It has been experienced the indicator decline of the rats' stress index of the IA + C group for by 30,2 %, in comparison with the IA group animals (e.g. P = 0,02) in the heart rate analysis (e.g. by R.M. Baevsky). So, all these indices in the IA + C group rats have not statistically and significantly been differed from the similar parameters in the OA group animals.

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Materials of Conferences

BASIC PRINCIPLES OF ENVIRONMENTAL MONITORING OF OIL AND GAS FIELDS AT THE INITIAL STAGE OF DEVELOPMENT

Kopylov I.S.

Perm State National Research University, Perm, e-mail: georif@yandex.ru

The concept of environmental monitoring (for example, Yurubcheno-Tokhomskoye oil and gas field – the largest in Eastern Siberia) provides a special system of observation, monitoring, evaluation, prognosis, and determine trends in the state of the environment under the influence of technological processes related to exploration and development of oil and gas fields [1–5]. Conducting monitoring is based on the construction and equipment of a special regime network and the availability of long-term program of observations. The monitoring program is based on the following fundamental principles:

1) a systematic approach – the dual performance of work for solving the overview, regional, local and detailed level;

2) the complexity of monitoring – monitoring characterize all natural ingredients: air basin, groundwater and surface water, subsoil, soil, topography, landscapes, vegetation, wildlife, social sphere;

3) the objective of monitoring – resulting information must be accurate and adequately reflect the changes taking place, which is achieved at the organizational and practical level of the works;

4) continuous monitoring – is essential to the work. Depending on the object of monitoring, surveillance should be regular (daily, ten-day, monthly, quarterly, annually);

5) the adequacy of monitoring – provides the volume of the research (quantitative aspect), and the correct choice of points, routes or observation points (qualitative aspect);

6) performance monitoring – involves unification, systematization, processing data, creating information databases and data banks;

7) stage nature of monitoring – a gradual increase in the number of observation as the development of facilities in order to achieve its maximum coverage, both in plan and in section.

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ABOUT SUPPORTING OF SMALL INNOVATIVE ENTERPRENERSHIP IN RUSSIA

Guremina N.V., Smirnov V.P.

Far-Eastern Federal University, Vladivostok, e-mail: innov-man@yandex.ru, russianbeauty@yandex.ru

The programs supporting high technology entrepreneurship at pressed and seed states by the Foundation for Assistance to Small Innovative Enterprises (FASIE).

The major strand of government policy in the innovation sphere is preserving of the accumulated scientific and technological potential and the development of appropriate infrastructure and economic mechanisms boosting the innovative processes.

It is well known that there is an innovation cycle and the very first stage of this cycle, when the project is a prototype only, implies thoroughly elaborated idea and at that great risks. Now this stage of the project of company development is called "death valley".

The Foundation for Assistance to Small Innovative Enterprises is that very institution which is called to support the enterprises during this "death valley" stage.

The Foundation gives young scientists the opportunity to check their inclination to the innovation activities through the financial support of their research and implementation of their first innovative ideas.

The main objective of the Foundation is seed and present investments into the innovative projects. Two programs are implemented in this sphere; these are "U.M.N.I.K." and "START".

"U.M.N.I.K." program which is the Russian abbreviation for "Participant of Scientific Innovation Competition for Young People" was launched in 2007. At present, it is the only program in Russia that helps revealing and supporting the young scientists striving to self-actualize by meand of innovation activities. One of the program main objectives is to bring the projects and it's participants is to the level of small innovative enterprises establishment. This process has already been launched [2].

The main program being implemented by the Foundation for the ten years already is called the "START" program. It grants three years of support. The Foundation concludes the government contracts under which it provides the financial support for completion of development process and launching the product manufacturing. The purpose of "START" program is to support scientists, technologies, students willing to develop and to assimilate the new products (goods, technologies) or services based on the results of their scientific research and with the financial assistance to the innovative projects at startup.

One more problem to be considered is that according to the terms of financing of small innovation enterprises there is a number of limitation on use of the allocated funds appropriated by Foundation. The short life cycle of the innovation projects is conditioned by a variety of external and internal reasons, among which is application of funds according to the "disbursement estimate" rather than according "development estimate". The expenditures according to the "development estimate" would have included the expenditures on business model generation, searching for the investor and project presentation, market research and so on. However, the Foundation has some limitations on expenditures.

Following up the 2009 Anticrisis Program of the Russian Federation the Foundation has carried out the open competition "Accomplishment of research and development activities an the priority areas of science and technology according to the Anticrisis Program of the Government of the Russian Federation". The program is aimed to support small enterprises that have achieved considerable results, have good prospects in further business development, import substitution and domestic demand expansion.

For 20 years of Foundation activity over 45 000 applications were received for research and development, more than 12,000 contracts concluded with small innovative enterprises of 75 subjects of the Russian Federation, more than 10 000 young innovators supported, more than 4 500 start-up created a network of 64 regional representatives of the Foundation formed on the territory of the Russian Federation. Currently, more than 160 small enterprises successfully mastered the program of the Fund and had the opportunity of further development thanks to financial support from other development institutions [1].

Summarizing the results of the Foundation activities during this years it is should be noted that small innovative enterprises in Russia has overcome certain difficulties and is still being developed of the economic situation. The struggle of the small innovative enterprises for recognition in scientific and technological and economic regard at high governmental level is stable yet successful.

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INFORMATION PROCESSING IN MOBILE SYSTEMS OF DECISION SUPPORT IN BUSINESS PLANNING

Medvedev A.V.

Moscow State University of Economics, Statistics and Informatics, branch, Kemerovo, e-mail: alexm_62@mail.ru

In the context of the wide availability of statistical and analytical information about the characteristics of business in different areas of social and economic activity, remains urgent development of decision support systems (DSS) in the scope of business planning, focused on the end user – the economist-analyst, entrepreneur, businessman. These DSS thus should be targeted for use in a mobile environment, which requires the development of the concept of information and analytical support, which obviously can currently be based on Internet-accessible socio-economic information. Socio-economic transformation of the global information networks for use in the modern financial and economic systems must pass several major stages:

1) from the Internet to a database of socio-economic information by expert determination aggregate information sites containing data set of different economic specificity (micro-, meso-, macroeconomic levels, financial, commercial, administrative, social etc.);

2) from a database of socio-economic information in files containing structured numerical data (usually in the form of time series data on asset prices and products, features of financial-economic activity of enterprises, industry specifics about exchange rates, on credit-deposit policy of financial institutions, the economic, commercial, domestic and foreign trade market conditions, financial and labor markets etc.) through expert selection of necessary information;

3) preliminary statistical and mathematical processing (usually in the form of averaging, ranking aggregation, inter- and extrapolation of data from selected expert time series) by determining the relevant expertise for future operations;

4) fully automatic placement of pretreated information in the application packages and DSS.

The financial and analytical package [1] solves linear optimal control problem and was designed for the evaluation of investment projects at various levels. One requires statistical and analytical information, the structure of which is shown in [2]. Important features of the information-analytical support of DSS said, the above conditions must be, on the one hand, the minimum set out in point 2 characteristics, and on the other – their adequacy for the revenue and expenditure flows of enterprises in accordance with the algorithms conceptually relevant accounting rules for calculating these flows, adopted in the Russian Federation.

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PROBLEMS AND PROSPECTS FARMHOUSE BASED ON FARMS TVER REGION

Kulakov A.V.

Yaroslavl State Pedagogical University n.a. K.D. Ushinsky, Yaroslavl, e-mail: andrey-394169@mail.ru

Rural tourism – one of the most promising and fastest growing trends in contemporary Russian tourism. Rural tourism or agritourism – is a form of recreation associated with the travel and stay of urban residents in rural areas to participate in agricultural activities and familiarity with traditional rural life.

The final product of rural tourism is not only living in a cottage, it's a whole range of services, which includes a visit and work in the apiary, horseback riding and caring for horses, fishing and living in a cabin fisherman, familiarity with the specifics of hunting specialist and direct participation in the hunt.

This use of natural and environmentally friendly products. Farmhouse is young enough tourist destination in Russia. Currently, this type of holiday is not yet among the Russians as widespread as abroad, where rural tourism is a very popular destination. Share of rural tourism in Russia is low and at the moment is about 3 % of the total turdeyatelnosti. However, our country has all the prerequisites for its further development. Contribute to this unique natural and climatic characteristics, eventful history and unique culture of our multinational country.

Keywords: rural tourism, agritourism, Tver region, farming, tourism activities.

Tourism in Russian Federation is today important branch making a notable contribution to gross domestic product. The part of tourism in gross domestic product of Russia made 3 % in 2013.

Introduction of the new direction of agrarian branch began in the Tver region about five years ago. These were single projects. People were engaged not so much in business, but it was business as a hobby, for themselves and friends. But it became clear soon that the organization of rural tourism is very effective and profitable: agritourism allows to combine farm development with a form of sale of received production and to become income practically without the additional expenses, going on further improvement and prosperity of this economy.

The Tver region holds an advantageous geographical position, it is situated on the route connecting Moscow and St. Petersburg. It raises significantly tourist streams. Many tourists (especially from abroad) who visit historical capitals of Russia want to have a look at the country remote place. The Tver region is quite suitable for such excursions in view of the close arrangement to Moscow. The regional center is a large road junction. The Tver region is really unique not only through flora and fauna, but also through the ecological purity. Hunting grounds are rich with various living creatures and wild fowl. The Tver region is rich with lakes and rivers. One of the greatest Russian rivers – Volga flows on the territory of this region, this river is not only a natural pearl, but also the significant transport waterway, that allows tourists, who takes a cruise, to have interesting excursions in farms of the region. Design capacity of pond farms allows providing the volume of cultivation of fish to 4000 tons per year [3].

Further development of agritourism allows the Tver farmers to gain additional investments into the main production, to improve quality of social conditions, to creative new workplaces, and so, involvement of young specialists to the village. Now in the register of management and external relations of the Ministry of economic development of the Tver region are registered 52 farms providing the most various services of rural tourism. They are expended on the territory of all Tver region, but leaders among municipalities are Kimrsky, Selizharovsky and Ostashkovsky areas. It is explained by a geographical position of these regions: Kimrsky municipal area is located between the regional center Tver and the Moscow region, on its territory flows the river Volga and Moscow Canal that provides a lot of tourists – Muscovites and guests of the capital; Selizharovsky municipal area is very rich by water resources (the lakes Sig and Volgo, the Volga River valley) which provide a picturesque landscape in combination with rich fish resources; farms of the Ostashkovsky area can make boast of an arrangement on the bank of a pearl of the Tver region – the largest and pure reservoir of area – the Lake Seliger. The lake is decorated with 160 islands located in its territory. On the most part of them farmers constructed the large network consisting of lodges of the fisherman and sports tourist bases for occupation by water sports. Such island situation allows placing separately the vacationers who wants quiet and measured rural situation in close nearness with the nature, natural food and comfortable conditions of accommodation. The following factors have to be considered at the starting of formation of the agritourism direction as one of the forms of activity of farms, in Russia and in the Tver region, by heads of farms: usefulness of an ecological situation, proximity to large highways for the purpose of involvement of transit tourists, existence of transport availability to the large cities and the cultural centers, development of social infrastructure and existence of unique environment round a farm for creation of recreation facilities. Farmers

of the Tver region develop special tourist programs, both group, and calculated on individual tourists. They surely include riding on specially trained horses, horse and foot walks on picturesque vicinities, visit of the nurseries located in the territory of a farm, with exotic pets, tasting of environmentally friendly production outdoors, visit of an apiary, fishing or hunting depending on a bias of specialization of a farm and an environment. Depending on wishes of tourists farmers realize entertainment programs – birthdays and weddings on ancient Russian customs are spent, forces of a farm will organize excursion trips in historical and remarkable places. The agrotourists visiting farms of the Tver region use rural furniture, the Russian stove, wooden benches and kitchen utensils, eat products and dishes of rural kitchen. Participation in different types of agricultural activity is offered to tourists in farms: landings of rare grades of vegetable cultures and potatoes, feeding of pets, collecting of mushrooms and berries. One of the most attractive forms of rest of tourists is visit of the real Russian bath, with a large amount of steam, use of natural brooms and extracts from local medical plants. Besides use of the Old Russian recipes which have reached us of a herbalisme by the Tver scientists unique technologies of preparation of medicines from flax, a girasol and carrots, proteinic medical additives from animal and vegetable components, production of natural food dyes and natural artificial sweetener were developed. It is in requisition, especially at foreign tourists through its ecological compatibility. Workers of farms tell tourists about rules of cultivation and harvesting, about the contents and care of cattle, learn to understand traditions and customs of national culture. Such activity of farms of the Tver region is visually shown available big population of horses, considerable development of apiaries and cultivation of the Russian fleet dogs for the organization of venery. It considerably distinguishes the farms of the Tver region which are engaged in rural tourism from similar farms of other areas.

Developing agritourism of head of farms of the Tver region solve partially the following problems of the village: reduction of unemployment rate and stimulation of inflow of the qualified young specialists to rural settlements of area; growth of the income and increase of a standard of living of villagers at rather small financial capital investments; insertion of means of farms in development of engineering and social infrastructure of the village, improvement of improvement of farmstead complexes and villages; development of ecological appeal and expansion of the range of production of homestead economy, and consequently to adjustment of communications of distribution system and realization on a place of production of a farm, in particular, ready-made products of food; preservation and revival of local customs and folklore; development of national crafts and increase of cultural and informative level of country people. And still a main objective of ecological tourism on the basis of farms of the Tver region is development of additional nonagricultural activity of local producers of agricultural production for receipt of money on reconstruction and modernization of the main production.

Users of services of the agritourism offered by farms of the Tver region are both citizens of Russia and foreign tourists. First of all it is business people who can't afford owing to the activity a long absence on a workplace, persons with rather low income and limited financial opportunities for participation in foreign trips, children during the school vacation, not wishing to spend vacation among a big congestion of children at summer camps. In the second turn it is the foreign tourists coming to the Tver region with the business purposes, preferring to stop in the quiet, pacified places owing to features of the character, or the foreign transit tourists moving on the territories of the region between the tourist centers [2].

Farmers confronted during the activity the following problems interfering further development of agritourism: deficiency of accurately formulated state and regional policy on agriculture and, respectively, system of standard legal support of this kind of activity; deficiency of the special federal legislation regulating activity of heads of farms in the field of rural tourism; deficiency at the Tver farmers of knowledge and experience in the field of service of foreign and domestic tourists.

One of the solutions of these problems is the state and regional support of farmers in the sphere of development of rural tourism. In recent years the Committee on tourism, resorts and international relations of the Tver region conducts planned and system work on development of rural tourism on the basis of farms of the Tver region. Every year the most various events are held for this purpose which purpose is involvement of an increasing number of the Tver farms in travel business. Since 2004 development of rural tourism was among tasks of Committee of tourism of the Tver region. In 2006 the planned program "Development of Agritourism of the Tver Region" was accepted, which was the subprogramme as a part of the national project "Agrarian and Industrial Complex Development". The Regional union of the farmers who are engaged in agritourism was created during implementation of the called program [2].

From 2008 to 2012 the federal target program "Development of Agriculture and Regulation of the Markets of Rural Production, Raw Materials and the Food for 2008–2012" acted on the territory of the Tver region. One of main objectives of its strategy was need to counterbalance supply and demand in this segment of the tourist market. At present the demand of rural tourism and interest offers to the Tver region considerably surpasses existing. Now the Tver farmers take active part in the federal target program developed by the Ministry of Sport, Tourism and Youth Policy in

common by Rostourism "Development of internal and entrance tourism in the Russian Federation (2011–2016)" made on the basis of the offers presented by subjects of the Russian Federation. Besides target programs in the region territory the Administration of the Tver region holds seminars and the forums devoted to problems of development of agrotourism on the basis of farms. So in 2008 the trip for the Tver farmers to the Republic of Karelia was organized for the purpose of acquaintance with the best practices of development of agritourism in the Russian Federation. Work of a seminar came to the end with work of a round table on the subject "Practical questions on implementation of activity of farmers in rural tourism". The first international forum "Rural tourism in Russia" passed In June 2012 in the Altai territory. During this forum participants discussed actual problems of agritourism and got acquainted with models of development of the rural tourism, functioning abroad. In June 2013 the seminar practical work "Formation and tourist's product advance in rural tourism" took place. Heads of the farms of the Tver region, representatives of regional and municipal committees on tourism, resorts and international relations of area listened not only a theoretical course, but also received practical skills in the sphere of rendering various tourist services.

Region farms actively advance the services in the tourist market: create sites of the farms on the Internet, send information on the farms to travel agencies, publish articles about problems and prospects of development of the farms in regional periodicals, participate at the All-Russian and regional exhibitions competitions devoted rural tourism. Example of such phenomenon is the competition held within the international forum "Rural tourism in Russia" where there was a fight between twenty projects of development of rural tourism in Russia. The Tver region at competition was represented by an agritourist farm "Ivanovka" awarded by the diploma and the silver medal "For Revival and Development of National Crafts".

The committee on development of tourism of the Tver region organized press tours on region farms for federal and Moscow mass media in the advertizing purposes during the period from 2008 to 2012. The most striking examples of farms of the Tver region which is engaged in the organization of rural tourism are following: "Blagodat" – the farm located in the village of the Vostsytorzhoksky area. It receives seven years constant guests from St. Petersburg, Moscow, Tver and Torzhok. Now the farm "Blagodat" is a peculiar brand rural rest. The farm "Batyr" located in the Rzhev municipal area, is the breeding horse farm having own horse-racing club and cynophile nursery. The farm is engaged in cultivation of rare breed of horses. The farm "Senavian" was founded in 2002 in Ryblovo's village of the Staritsky area and now works in the sphere of rural tourism. On the basis of the farm there is the nursery of Russian greyhound "Senavian" and horse stable. On the territory of the farm live different wild animals. Fascinating horse campaigns and walks, and as the most interesting venery are offered tourists.

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Materials of Conferences

MEDICAL PLANTS OF THE CHECHEN REPUBLIC – FOR MEDICAL PRODUCTS

Khasbulatova Z.S.

Chechen State Pedagogical Institute, Grozny, e-mail: hasbulatova@list.ru

The article goes about the necessity of the researching chemical constitution of the medical plants in the Chechen Republic and about the elaboration of the recommendation on their usage as medical products for human and animals.

For a long time medical drugs and folk-medicine had been the only way of treatment for many kinds of diseases and illnesses; the experience of the Chechen ancestors should not be forgotten as it is a part of our multinational culture.

The people's experience that was handed down from generation to generation can be extremely useful for hundreds thousands of modern ill people worldwide.

Medical plants and advice of well-known sorcerers, healers and herbalists were used by decades of the previous generation; it is the wisdom of our ancestors that we should use.

Nowadays medicine made of natural products alongside with synthetic ones play still an important role. The task of the modern pharmacology is to find active compounds of the botanical and animal extracts and molecular target they influence.

Natural medical products influence the organism of the human with the help of the function unity of living systems. The organism of medical plants that does not have nervous system is full of low-molecular adjusters – hormones.

During the last decades modern post-genomic technologies provided a powerful impulse for elaborating new kinds of medicines and modifying the existing ones.

More than 4000 species of plants grow in the Northern Caucasus. More than 200 of them are used in the modern medicine; more than 1000 are used in the folk-medicine. About 3000 wild plants that grow in the Northern Caucasus have not been studied yet. Their chemical constitution is not known and there pharmacology and biology features are not well-learnt. Because of it the group of natural medicine products cannot be made bigger by new products and nutritional supplements for living organisms (men and animals).

The research includes the information about 396 vascular plants that grow on the territory on the Chechen Republic.

Scientific literature does not provide us with the information about the chemical constitution of the biologically active substance of the medical plants that were studied by the authors. Pharmacologically active substance of the medical plants of the Chechen Republic are to be determined (they are glycosides, aethereal oils, alcaloids, flavonoids, tanning agents, alcaloids, phytoncides, saponins, etc.).

Everything that was said proves that chemical constitution of the useful agents of the Chechen medicine plants should be thoroughly studied and the recommendations on the usage of the medicines for living organisms should be established.

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INNOVATIVE TECHNOLOGIES IN THE DEVELOPMENT OF PROCESSES OF HUMAN LYMPH AND BLOOD HYDRATION IN HEALTH AND CANCER

Vapnyar V.V.

Federal State Budget Institution "Medical Radiological Research Center" of the RF Health Ministry, Obninsk, e-mail: vap@obninsk.com

Objective of work: define the power of interaction between hydrated ions of energy of linked water biophysical microstructures via nuclear-physical methods, evaluate interaction between molecules of water and a number of chemical elements of multilayer polarized structure of lymph and blood, thermodynamics of a healthy person and patients with cancer.

Methods and materials: 165 adults have been examined. 60 of them were practically healthy (group I), 105 of them were had cancer of lungs, stomach, rectum, womb, urine bladder, lacteal gland (group II). 18 elements were defined in venous blood serum and lymph, taken from hypodermic vessels of lower shin via non-destructive nuclear-physical method. According to international standards (H-4) LASA and also parallel methods of neurone-activation and rhoentgenologic-fluorescent analysis, defined in concentrations of Fe, Zn, Rb, research accuracy was evaluated.

NMR evaluation of spine-grid relaxation (T_1) of hydrogen cores in blood serum and lymph water has been carried out on a small pulse spectrometer "Minispek RS-20" under a resonance illumination frequency 20 MHz and temperature $39 \pm 0{,}1$ °C. Time difference $*T_1$ of probes T_1, evaluated before and after ultrasound processing , allows us to judge a condition of related fraction of water in samples. Is it implied that greater index of $*T_1$ results in a wider related layer. The level of reliable differences in samples is calculated according to t-criterion of Student.

In group I lymph had low indexes of Se ($p < 0{,}001$), Ag ($p < 0{,}05$) in comparison to blood serum. After lyophilic drying of lymph samples

contents of Sb, Cl ($p < 0,001$) was 3–5 times greater than in blood serum, and Rb, Zn, Br, Mg ($p < 0,001$), Hg, Co, Ca, Na ($p < 0,01$), Mg ($p < 0,05$) increased 1,5–2 times. Comparative analysis of most elements in dry remains of lymph has not revealed significant differences ($p > 0,05$) after lyophilic drying.

In group II lymph concentrations of Na, Se ($p < 0,001$), K ($p < 0,01$), Al ($p < 0,05$) had low values in comparison to the same elements of blood serum. Contents of Na, Cl, Al, Co, Br ($p < 0,001$), Ag, Fe, Zn, Hg, Sb ($p < 0,01$), Cu ($p < 0,05$) was increased 2,5–10 times in dry remains of lymph in comparison to elements of dry blood serum mass. Lymph concentrations of Br ($p < 0,001$), Na ($p < 0,01$), Sb ($p < 0,05$) were low, and Mg, Co ($p < 0,001$), Hg, Ag ($p < 0,01$), Zn ($p < 0,05$) – high in comparison to lymph elements of healthy people. Process of lymph drying leads to an increase in Hg, Zn, Co ($p < 0,001$), Ag, Fe ($p < 0,01$), Cr ($p < 0,05$) and decrease in Br ($p < 0,001$), Sb, Na ($p < 0,05$).

Value of index T_1 in blood and lymph serum of group I equaled $2,52 + 0,034$ c and $1,65 \pm 0,012$ c ($p < 0,001$) correspondingly. In groups I and II average value of index $*T_1$ in blood serum equals $0,059 \pm 0,0060$ c and $0,11 + 0,006$ c, lymph – $0,055 \pm 0,010$ c and $0,19 \pm 0,012$ c ($p < 0,001$). Via mehod of the smallest squares we have defined proportional increase in index $*T_1$ of lymph that depended on degree of tumor progression in TNM system. Results of diagnosing sensitivity and efficiency of the methods according to parameter $*T_1$ equaled 81 and 83 %, while according to parameter $*T_1$ of blood serum they were equal to 60 and 67 % correspondingly. According to contents of Al, Sb, Zn in dry remains of lymph, efficiency of the diagnosing method equaled 93–95 %.

Therefore, lymph is more enriched with water and a number of chemical elements among healthy people that blood serum is. Lymph and blood serum of healthy people contains a linked fraction of water that increases in presence of cancer. Progressive increase in hydration degree, number of lymph and hematogenic tissue allow us to develop a number of prior tests in cancer diagnostics. The received results can be interpreted from the position of multilayer polarized structure at the foundation of hydrating lyotropic lines that represent diameter of the ion itself and diameter of water molecules that are able to rest near them. The most hydrated ions contain more molecules of water and energy around them. Linked fraction of water in extracellular space can be represented as an electrically-charged system of colloid ions of lymph and blood that contains ions of multilayer polarized structure of different hydration degree. In such configurations protons are distributed due to induction that is equaled with dissociation constant. Potential energy increases as electron closes up with core. Graphs of low and high limits of ions' polarization register their significant contribution into the general energy capacity of cells (Ling G., 1962, 2008).

Well-hydrated ions can represent a depot of potential induction energy in a multilayer polarized structure. Average- and low-polarized layers, placed in order of directed hydrated ions ad hydroxide groups, have a significant mobility and activity with a small resource of own internal energy. Generally, linked fraction of water that has certain specific characteristics of emitting interactive fractions of a solved substance, can play as a link of exchange flow between charged particles, ions, water molecules, have an influence upon tissue structures through electromagnetic energy. Volumetric fraction of water, placed under a weak influence of free energy, coming from the whole volume of linked hydrated layer, possesses unstable characteristics of stabilization, presence of high entropy, phase transitions, fluctuations. Self-organization and formation of biophysical processes of multilayer polarized layers has a non-linear nature.

Thus, innovative technologies allow us to estimate linked fraction of water in lymph and blood that can be represented as electrically-charged heterogeneous system that contains multilayer polarized structure of extracellular space. In normal state internal energy of thermodynamic tissue system is concentrated in well-hydrated layers and spread unevenly into average- and low-hydrated layers as free energy along with an increase in entropy in free layers where processes have dynamic and easily-reversed nature. In terms of cancer stable increase in internal energy of polarized hydrated layers will go along with an expressed flow of particles, heterogeneous hydration degree, elevation of certain elements due to redistribution of free ions and water molecules from blood to lymph.

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PATHOGENETIC FACTORS CAUSING FORMATION OF CHRONIC GASTRODUODENITIS IN CHILDREN, CONSUMING DRINKING WATER WITH HIGN CONCENTRATION OF MANGANESE AND HYPERCHLORINATION PRODUCTS

Zaitseva N.V., Ustinova O.Y.,
Luzhetsky K.P., Maklakova O.A.

Federal Budget Scientific Institution "Federal Scientific Center for Medical and Preventive Health Risk Management Technologies", Perm, e-mail: ustinova@fcrisk.ru

Introduction. Contamination of drinking water with chemicals of man-made origin generates negative trends in prevalence of digestive system diseases and, above all, chronic inflammatory diseases of the upper gastrointestinal tract [1, 3]. The presence of residual hyperchlorination products and heavy metals in drinking water causes

the occurrence of additional cases of gastroduodenal disease at the level of 18 % annually, increases the number of children with abnormal and complicated forms of gastroduodenal diseases, including hypotrophic and atrophic chronic gastroduodenitis (CGD) [1, 2, 4]. The likelihood of hypotrophic and atrophic damages developing of the mucous membranes of the stomach and duodenal ulcer (DU), the causes of their genesis remain the most debated issues of pediatric gastroenterology [2, 4]. Some researchers see the correlation between the CGD and adverse effects of chemicals of man-made origin [2, 5]. However, pathogenetic factors for CGD development, associated with exposure to chemicals of man-made origin, remain under-investigated.

The **aim** of this study was to investigate the pathogenesis of CGD Hp (–) in children consuming drinking water with high concentration of manganese and hyperchlorination products (chloroform).

Materials and methods. The study group comprised 116 children with CGD Hp (–) aged 7–10 years (8,6 ± 1,2 years), living on the territory with unsatisfactory quality of drinking water in terms of sanitary-chemical parameters (content of chloroform – to 2,7 MAC, manganese – to 3,3 MAC). The comparison group consisted of 56 children with CGD Hp (–) of the same age (8,4 ± 1,4 years, $p \geq 0,05$), living in the area where drinking water quality complies the hygienic standards. The air quality in the living territories of the children from both groups corresponded to hygienic requirements. The groups have been matched by gender. All children had negative results of "Helika test" and ELISA blood test for antibodies to Helicobacter pylori.

Chemical-analysis study of manganese in blood has been performed by atomic absorption spectrophotometry method on the spectrophotometer AAnalyst produced by PERKIN-ELMER (USA); detection of chloroform – by gas chromatography on the chromatograph "Chromatec-Crystal-5000" with the halogen-selective detector.

The clinical examination of children included: socio-medical questionnaires, analysis of outpatient-card of development, examination by pediatrician, gastroenterologist, neurologist. Autonomic nervous system status assessment has been carried out with the use of cardiorhythmographic programme "Poly-Spectrum". The assessment was based on the cardiac rhythm mathematical analysis. Ultrasound scan of liver, gallbladder, biliary tract, stomach and duodenum has been performed according to standard procedures on the unit "Toshiba VIAMO" (Japan) using convex (1,9–6,0 MHz) and linear (7,0–14,0 MHz) multi-frequency sensors. Fibrogastroduodenoscopy has been carried out according to standard procedures with mucosal biopsy of 2 sites. Analysis of the information has been performed with the use of statistical methods (Statistica 6.0) and with the help of specially designed software, coupled with MS-Office applications. For the comparison of quantitative characters two-sample Student t-test has been used; evaluation of dependencies between the characters has been performed by the method of regression analysis.

Results of the study. All children, included in the study group, were born from 1–3 pregnancies, had no congenital abnormalities of the gastrointestinal tract, carried to full-time (95 % – study group and 94,1 % – comparison group; $p = 0.34$), had close weighty growth parameters at birth (3241,3 ± 154,6 g and 51,2 ± 0,6 cm – study group; 3132,4 ± 162,4 g and 50,37 ± 1,56 cm – comparison group; $p = 0,43–0,48$) and Apgar score (8,12 ± 0,20 scores vs. 8,58 ± 0,10 scores; $p = 0,20$). The frequency of recording in the history of acute intestinal infections in the two groups did not differ (10,3 and 12,5 % respectively, $p = 0,67$). Most children (79.3 % and 73,2 % respectively, $p = 0,37$) were raised in families with middle-income (12–14 thousand rubles per family member), lived in comfortable housing and used tap water without further purification (95 and 87,5 %, respectively, $p = 0,24$). Violations of the nutritional status of children was noted by 32.8 % of parents of children in the study group and 25 % – in the comparison group ($p = 0,29$). Duration of the disease in children of the study groups was 2,1 ± 1,1 and 1,9 ± 1,2, respectively ($p = 0,72$).

During the chemical-analysis studies of blood it was found: manganese concentration in children of the study group was 0,0283 ± 0,0042 mkg/cm^3 (reference concentration – mkg/cm^3 0,011, $p < 0,01$); chloroform – 0,019891 ± 0,006675 mkg/cm^3 (reference concentration – mkg/cm^3 0,0, $p < 0,01$). In the comparison group the manganese concentration was 0,011389 ± 0,001434 mkg/cm^3 ($p < 0,01$ to the study group), chloroform – 0,002009 ± 0,000701 mkg/cm^3 ($p < 0,01$ to the study group). In general, the concentration of manganese in children of the study group exceeded the rate in the comparison group by 2,6 times ($p < 0,01$), chloroform – by 10 times ($p < 0,001$).

The comparative analysis of the incidence of complaints of gastrointestinal character showed that children in the study group noted more frequently decreased appetite (91,4 and 61 %, respectively, $p = 0,04$), gaseous eructation (45,5 % vs. 25,4 %, $p = 0,03$), abdominal pain (58,6 % vs. 37,2 %, $p = 0,03$), localized in the epigastrium (58,2 % vs. 23,2 %, $p \leq 0,001$) or right upper quadrant (61,2 % vs. 32,1 %, $p \leq 0,001$), disorders of intestinal habits (78,5 % vs. 57,1 %, $p = 0,004$). Among the complaints of astheno-vegetative character the most frequently mentioned included: sweating (37,1 % vs. 10,9 %, $p = 0,02$), fatigue (16,4 and 8,6 %, respectively, $p = 0,04$), transport intolerance (6,9 and 5,4 %, $p = 0,82$). In children of the study group the hepatobiliary dysfunction symptoms were recorded 1,4 times more likely (87,9 and 64,3 %, respectively, $p = 0,001$). The significant causal relationship of probability of the development of biliary

tract disease with the elevated blood levels of chloroform (R2 = 0,29; F = 36,92; p = 0,001) and diseases of the nervous system of functional nature – with the high concentration of manganese and chloroform (R2 = 0,50–0,77; F = 93,67–109,62; p = 0,01–0,001) has been determined.

The predominant type of vegetative tonus in children of the study group was eutonia (50 %), but in 37,5 % vagotonic option was revealed, which is 1.9 times higher than in the comparison group (20 %, p = 0,02). In the study group the sympathicotonic type of autonomic reactivity was observed in only 25 %, which is 1,2 times less frequently than in the comparison group (30 %, OR = 1,2, CI = 1,1–1,7, p = 0,04), the predominant type was hypersympathicotonic (62,5 %); in the comparison group this option was met 1,5 times less frequently – 43,3 % (OR = 1,45, CI = 1,16–3,11). The direct significant correlations of elevated blood manganese and initial development of vagotonia (R2 = 0,41; F = 98,72; p = 0,01) have been established; elevated blood manganese and hypersympathicotonic type of autonomic reactivity (R2 = 0,37; F = 87,54; p = 0,01). During the ultrasound scan of hepatobiliary area the reactive changes of the liver in the study group were recorded 7 times more frequently (31,7 % vs. 4,5 %, p = 0,01), in addition, 1,6–1,7 times more frequently the biliary dysfunction of hypokinetic type took place (80,2 % vs. 50 %, p = 0,001) and an increase in the linear dimensions of the liver (12,2 and 7,0 %, respectively, OR = 1,74, CI = 1,32–3, 76, p = 0,05). There was a significant correlation between the elevated chloroform concentration in children's blood and the development of reactive changes of the liver (R2 = 0,39; F = 76,83; p = 0,01), higher concentration of manganese in blood and presence of biliary dysfunction of hypokinetic type (R2 = 0,41; F = 99,23; p = 0,01).

During the ultrasound scan of the gastroduodenal area a moderate amount of fluid in the stomach was determined in children of the study group 3 times more frequently than in the comparison group (33 and 11 %, respectively, p = 0,003). Physiological variant of motor function of the stomach and duodenum in children of the study group was met 2 times rarer (14 % versus 28 %, p = 0,03). Duodeno-gastric, duodeno-bulbar, bulbo-gastric reflux was detected in the study group 1,4–1,5 times more frequently (OR = 1,41–1,52; CI 1,12–3,87, p = 0,01–0,03). The causal link of the high concentration of manganese in blood and the impaired motor function of the stomach and duodenum (R^2 = 0,25–0,52; F = 46,5–119,18; p = 0,01–0,001) was found.

During the endoscopy the incidence of atrophic and hypotrophic changes of antral gastric mucosa in the study group was 3,4 times higher than the comparison group (18,1 % versus 5,4 %, p = 0,01). The causal link of the high concentation of manganese in blood and the atrophic and hypotrophic changes of the gastric mucosa (R2 = 0,21–0,36; F = 58,11–94,32; p = 0,01) has been established.

Discussion. The results of the performed study suggest that in children consuming water of inadequate quality (concentration of hyperchlorination and manganese products > 1MAC), the chloroform and manganese concentration in blood substantially exceeds the reference level. It has been found that the elevated concentration of chloroform and manganese in blood contributes to the development of autonomic parasympathetic dysfunction by parasympathetic type, reactive changes of the liver, biliary dysfunction of hypokinetic type and dysmotility of the stomach and duodenum by the hyperkinetic type. The effect on the gastric mucosa of bile acids results in solubilization of the lipid surface of epithelial layers' membrane. According to the literature [2, 4] the lecithin contained in the bile by the action of pancreatic juice phospholipase is biotransformed in lysolecithin, which in case of contact with the stomach has a strong cytotoxic effect on the epithelium and the subsequent development of hypotrophic processes. The biliary dysfunction by the hypokinetic type initiated by chemical toxicants combined with hyperkinetic disorders of gastroduodenal sphere underlie the development of the sub- and atrophic changes in the mucosa of the stomach and duodenum. The emerging technologies of prevention should be aimed not only at increasing the activity of the processes of biotransformation of chemicals and their elimination, but also at the correction of autonomic dysfunction, gastroduodenal and biliary motility.

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