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THE CONCEPT OF PROFESSIONAL-COMMUNICATIVE COMPETENCE OF STUDENTS

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The conception of modernizing Kazakhstan education of 2010 has defined the need for a new quality of education as prior problem of educational policy in XXI century. Developing the system of training specialists of international qualification is presented as a problem, solution of which defines innovative activity of the society in the area of pedagogic and scientific-technical collaboration.

Keywords: professional-communicative competence, students, modernizing Kazakhstan education

Prospects of Kazakhstan entry not only into the single economic space, but also to its advancement to the level of international collaboration in terms of higher education requires a deeper comprehension of problems, related to forming professional-communicative competence among students in pedagogic theory and practice, and providing competitive achievements at the international market.

One of the most significant topics in terms of methodical discussions is the problem of necessary competences, ways and methods of forming them as well as personal management skills of future specialists. In this case it proves logical that key competences that are treated with special attention by European society, have been outlined in traditional education. The list of key competences (symposium «Key competences for Europe», Bern, 1996) that are interpreted as most significant ones in pedagogy, psychology, and job specification includes: social competence (an ability to take responsibility for making professional decisions, corporate culture; expression of tolerance towards different cultures); communicative competence (skills of communication techniques, including digital communication); cognitive competence (readiness and ability to obtain new knowledge and skills independently, realize one's own potential); social-informative competence (mastering informational technologies and ability to accept criticism from sources of social information); special competence (readiness to carry out professional functions).

Thus, an important component in activity of future specialists becomes not only his special knowledge, but his general ability for communicative organization of professional activity in terms of various social-economic conditions in collaboration with representatives of different professional communities and cultures.

An active development of international collaboration in all areas has been observed in Kazakhstan during the recent years, and renewal of Kazakhstan education cannot take place without consideration of these trends. Factors that define key competences include: academic

mobility and globalization of education; broadening professional activity of future specialists, and taking it to the level of international communication; the necessity to know foreign languages and other means of communicative influence; shifting priority in situation of making decisions towards decentralization and independence in terms of responsible choices; introduction of informational technologies into professional activity; the necessity of continual improvement in education and qualification in order to preserve competitiveness of our specialist at the global market.

Since social context in students' activity becomes more visible, basics of professional and inter-cultural communication become the basic element in their training. It is important not only to form special skills and knowledge, but developing professional-communicative competence, ability for communicative organization of professional activity as a display of a specialist's expertise that provides for an efficient selection of means to achieve certain goals via ability to communicate professionally.

It allows one to outline *professional-communicative competence among a number of other competences as one that defines quality of higher education*. According to the author, competence is a general ability that is based on knowledge, experience, values that have been obtained during the process of training, and is studied as a possibility to establish relation between knowledge and a professional situation, in other words, an ability to find the procedure of implementing knowledge into action in order to solve certain situation.

Thus, developing the theory of professional-communicative competence in terms of increase in education quality is an urgent scientific problem, solution of which will improve efficiency of students' professional activity. It will contribute significantly to solving the problem of developing the system of training world-class specialists, set within the Concept of modernizing Kazakhstan education for the period up to 2010.

At the same time a necessity to solve obvious conflicts that are typical for modern system of education and training students: first of all, it is a conflict between the demand for education of a person and social expectations, and also a conflict between the need for qualified specialists and practice of training these specialists. In order to solve problems in forming professional-communicative competence, pedagogic science also needs to solve problems that are linked to forming an integral, modern idea on the profession among specialists, adaptation to new social, economic, and intercultural forms of professional activity in terms of economic internationalization and developing intercultural business contacts.

Social-economic processes in the society, need for specialists of new quality define strategy of modernizing education quality and professional training of specialists. The most urgent problems of modern domestic education have become a subject of complex investigation in works of many researchers.

Motivation and quality of training specialists is one of the basic directions of psychology-pedagogic, sociologic, and philosophic studies. Practice of target training of students

has clearly defined a range of problems than still have to be solved by pedagogy:

- Does the contents of education correspond to requirements, placed by the society in front of a person and level of his special and social competence nowadays, and can they always adapt to new intercultural forms of professional activity.

- Is it possible to speak of increase in specialists' education quality regardless of intercultural aspect in it, system developments on forming general-professional competence considering lack of competence quality evaluation means according to qualification characteristics;

- What potential must possess a tutor who trains a specialist.

An increase in professional and social adaptation quality can be possible in case professional-communicative competence is formed.

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**FEATURES OF PREPARATION
PROGRAMMERS IN INSTITUTIONS
OF HIGHER LEARNING OF KAZAKHSTAN
(OPTIMIZATION OF PRODUCTION
PLANNING WITH LIMITED RESOURCES)**

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Presently the swift height of volume of different types of information does impossible mastering by everybody in full her new theory in maintenance of education at his professional preparation. All of it results in the necessity of realization of researches for perfection of effective special of professional preparation, by creation of certain didactic terms. However, before tasks in hand on specialization of trade education of programmers did not allow in a sufficient measure to work out all his educational problems. In course of time became obvious, that it is related to that volume of information and task that a professional must decide constantly improves and increases. This height attained enormous sizes for today, especially in such scientifically based industry of Information Technology and related to him to specialties. All of it hampered the decision of problem by one specialization at preparation of corresponding specialists. Deciding a problem was possible only on the basis of bringing and

As an example for perfection of maintenance of education it is possible to bring words over from a book «Revolution in educating» Gordon Draidner and Djanet Vos, where the problem of the modern world is perfectly described in area of education, inherent to many states. They write, that the «World changes so quickly, and the systems education are so unresponsive to new ideas and inert, as though, getting in the trap of time, they continues to serve a past epoch that made» off a long ago [3, c. 378]. All these words were said as though and for us in accordance with vision of prospects of development of our time and certainly in our address.

Necessity of account for maintenance and methodology of educating to programming, specific of profile of preparation specialist in the system, higher education caused by the necessity of substantial improvement of preparation of growing up to professional activity. It is therefore enough to mark that educating to information technologies and programming in professional educational establishments must come true taking into account particularities of profile specialization of future graduating

students of programmers. Such approach allowed to educe the ways of creation New Information Technology, endowed in forming of new world view ideas about possibility of computerization and complex computer-aided manufacturing in a prospect. All of it supposes to extend not only ability correctly to formulate tasks and decide them by means of computers but also work with a modern informative technique, including possibility овладения technologies of the modern programming and maintenance of computer technology.

As far as practical introduction in educational establishments of the computing engineering, accumulations of experience on application in educational aims, since 1985 in parallel in countries the CIS and in Kazakhstan at preparation of specialists on programming, computerization of educational establishments of universal and professional education began to be conducted in life. This process got in the beginning to maintenance of education for preparation of specialists of IKT and especially on programming.

Analyzing the investigations conducted in Kazakhstan on a theme психолого-педагогической preparation of programmers in the system of continuous education, it is possible to come to the next conclusion. Authors examine computerization as not aim, but as means of educating, not denying traditional forms and methods of educating. Thus they sent the efforts to opening of basic possibilities of IKT, watching out for their perfection in the process of organization of works on application of innovative methodology. However not what methodologies sent to the prospect of психолого-педагогической preparation of programmers, or on development of innovative decisions of problems, not present and does not offer, considering that they recommend, as is sufficient. Maybe, these recommendations can be taken into account, because at one time they were faithful and by a correct decision.

For comparison, and as a reference-point took interesting researches, present Russian authors. Universal technology of computerization of educational courses concept base of that based on obvious hierarchical presentation of material was there described, the scenarios of reading are worked out with использованием approaches as a hierarchy. Developments of criteria interesting for the estimation of actions of taught, that take into account feature and advantage of using, outlines of data. Pedagogical terms assisting the increase of efficiency of application of technology, which is motivated totality of requirements, are certain to planning of methodical developments. In separate works the problems of the use of new ИКТ are investigated in an educational process and recommendation on the use of web- pages of Internet. However these works give a reference-point only, because fall short of to the path chosen by us.

With arrival in educational establishments of the newest computer technology with vast possibilities and office equipment of the last generation, possibility appeared it is wide to use them in an educational process. There were created local and global networks resource in the manner of electronic libraries, magazines, electronic textbooks. Possibility of creation of centers of the controlled from distance educating appeared, it is wide to master the various resources of network the Internet. Students work as with Web- servers, Web- page create, placing on them information about the institutions of higher learning and interests. The use of telecommunication networks in the process of educating allows by means e-mail to participate in teleconference of the different scale and territorial distributions with a transmission and receipt of materials from different archives and databases. Work is possible in virtual classes with coevals from different cities and world countries, participating in remote Olympiads and competitions, that considerably promotes motivation to education.

Analyzing works of the Kazakhstan scientists it is possible to come to the conclusion, that were exposed by them methodical essence new innovative information's and information's technology, as modern perspective pedagogical technologies. They consider that problems of the future education based on the use of Information technologies, which are concluded in creation of pedagogical technologies and introduction methodical innovation in an educational process at educational activity.

System of higher education in the conditions of new communication to technology, forming of new model of preparation of programmers supposes, conditioned on the change of the educational programs. The major instrument of mechanism, allowing to carry out control after quality of preparation of students-programmers, is government's standard of education bases of the education are pawned, in particular introduction in an educational process new to information's technology in higher education that supposes creation of united network of e – mail for institutions of higher learning with their subsequent plugging in methodical network of Internet.

Today there is enormous experience of attaching to the computer of the taught different age-related groups : students, schoolchildren, children of junior school and even preschool age. The use of Information technologies in an educational process allows to organize cognitive activity to optimize an educational process, increase the volume of information, reported on employments, promotes interest in educating. All of it, undoubtedly, conduces to drastic structural alternations of organization of educational activity, to the origin of her new kinds and forms in the process of forming of skills, knowledge, abilities.

The system of preparation of future engineers-programmers in the system of continuous education plugs preparation in bachelor and city council. The basic criterion of completeness of educational

process in бакалавриате is mastering by a student no less than 128 credits or a 5760 o'clock of the theoretical educating and no less than 10 credits or a 630 o'clock of professional productive practice. Thus a student must master 79 credits or 3420 hours on an obligatory component and 49 credits or 2340 hours on you to the coniferous forest of institution of higher learning [3].

Last years, all consumers marked low level teaching of profile disciplines, providing the necessary level of professional knowledge and abilities that would be directed directly on vaccinated for the specialist of necessary skills of work with technology on creation in the workplace digital resources. Such phenomenon experts explain a few reasons having, lately place in practice of preparation of specialists in professional educational establishments. They following:

- firstly, maintenance of education of programmers falls behind from the state and level of development and practical application of IKT in practice, therefore graduating students constantly have after completion of educational establishment to be taught again, because they are not ready to creative work;

- future specialists in the process of preparation are not acquainted enough with maintenance of activity of industry, their structures and tasks executable each of links of enterprises of industry, to adapt oneself, graduating students are often taught again;

- future programmers not always are acquainted with new programmatic works, used lately in practice in industry on the whole and by novelties in general in area of development of information technology;

- in an educational process does not acquaint with the novelties of technical equipment's of IKT, applied equipment quickly become antiquated and fall behind from the last achievements, because educational establishments do not have sufficient facilities on acquisition and permanent updating of technical equipment's.

All of it can be explained by objective and subjective reasons taking place in modern educational establishments of trade education.

Experience specialists consider that equipment in educational establishments must be updated with periodicity at least one time in a year. Then there will not be lag in the field of technical equipped in area of IKT and telecommunications. In addition, changing of technologies and work in the plan of mastering of the new programs takes place quarterly. Some educational establishments in our country have a no possibility to occupy professional monitoring of labor-market, to trace modern trends of industry, although in an ideal institutions of higher learning foresee events on many years forward, and not generate unclaimed specialists. Until home system of education is not mobility. Preparation of specialists is not correlated with modern, by the constantly changing requirements of labor -market to the programmers.

To follow in the process of forming of maintenance to the state of affairs of modern requirements,

institutions of higher learning were under an obligation to adapt for the terms methodology of education and educational materials and anymore attract of leading specialists practical workers to work with students on implementation of independent tasks.

With the purpose of reduction of lag of rates of preparation of specialists in the system of continuous education, from the level of height of necessities of home industry of information technology, and also increase of level qualifications and training of the specialized personnel's (testing, managers of designers and other computer specialties), it is necessary to realize in the process of preparation of programmers next didactic events:

- it is creation in the conditions of republic of educational-consulting Center remote and internal practical education programmer on information technologies and management;

- it is organization Kazakhstan informatively-educational Internet there is not an university of information technologies;

- it is development of permanent international cooperation with the anchorwomen of educational, training organizations in the field of IKT.

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LECTURE IN TEACHING PROCESS

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Lecture is one of traditional forms of teaching. This form can be effective in transmitting large amounts of information to large student audience in a relatively small amount of time. Traditionally lecture is a monologue pronounced by lecturer before a large audience. It is so called one-way movement. Even in his time Mark Twain pointed that professor's lecture notes go straight to the students' lecture notes, without passing through the brains of either. Nowadays students are rather often passively attending the lectures. In recent years the prominent scientists of Stanford and other universities expressed their doubts concerning utility of lectures in understanding of their content and expanding thinking. They consider that pronounced changes are needed in medical student education, including a substantial reduction in the number of traditional

lectures, so as it is unreasonable waste of class time. They propose a new teaching method named «Lecture halls without lectures». Thus the main disadvantage of traditional lectures is their inability to promote active engagement of students. Due to this lectures can be boring and of low efficiency.

Implementation of multimedia technology in teaching process improved presentation of lectures. Some lecturers are strongly carried away by this form of presentation, and new type of lecturer «visual information givers» was identified. They provide students with full notes and give them time to copy information. But such form of lecture does not involve students in process of thinking.

One of the ways to overcome the student mental passivity at the lecture is interactive form of lecturing. Using the interactive lecture helps students to develop the habits of thinking while listening, applying past knowledge for understanding new information presented in the lecture.

There are different types of interactive lectures. Interactivity can be readily introduced to lectures without a significant reduction in the amount of available lecturing time. Selecting the type of interactivity depends on the content of the lecture and the audience features. It is well known that audience is not homogeneous. Its active part usually occupies the front rows of lecture hall. The involvement in listening and cooperation of the largest part of audience depends on lecturer's skill. Lecturing is an art that is akin to the performances of artists on stage.

Analysis of information on the usefulness of lectures suggest the following conclusions:

1. Lecture is an important part of the studying process. It should not be completely excluded from the learning process. Its share in the resource of time may be decreased if it is reasonable.

2. Lectures should be used to present the fundamental issues of the subject.

3. Quality of lecturing depends on the content and logical structure of material, the peculiarity of audience, the personality of the lecturer and his experience.

4. Lecture should be fruitful collaboration of lecturer and students that is possible in interactive form of lecturing.

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DISTANCE LEARNING TEACHERS' TRAINING

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It is known that post graduate or Professional development is a crucial part of Education system. Especially teachers who work in the secondary

schools should always get up to date information, new methods and their specific features in the process of learning environment. In Uzbekistan the traditional teacher training system operates for secondary schools. The process of training and retraining of teachers is carried out in 14 Regional Teacher Training institutes.

Under the present conditions, there are new alternative forms of teacher training having been effectively organizing for the purpose of improving professional and personal competency of today's teachers. The organization training courses for teachers in distance must take into account the specifics of the academic subject. Their introduction was carried out step-by-step:

The first phase – At this stage the content of the educational process in the traditional and effective distance training courses based on modular training program to be analyzed.

Second step: improving the content of modular training course materials for secondary school teachers.

The third step: improving the technical implementation of training materials of modular courses using the platform MOODLE;

The fourth stage: Organized and conducted Pilot DL modular training courses for secondary school teachers in the selected regions.

As practice has shown, and an experimental study, distance learning, not only increases the density of information exchange, but also requires an understanding of the specific didactic educational process – especially, the changing nature of relationships and interactions of teachers and students.

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ON PROBLEMS OF MODERNIZING LINGUISTIC EDUCATION IN KAZAKHSTAN

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The main topic of the article is reformation of the educational system and particularly of language education in the transitional period in Kazakhstan. The author insists on the necessity to take into consideration new status of Kazakh, Russian and English. The article touches on psychological peculiarities of learning second /third languages and their methodological basis.

Modern globalization defines conditions of social-cultural modernization, including opening and expanding borders of linguistic space. Modernization of Kazakh education system is mainly related to renewal of its content, provision of active, developing, culturally-corresponding nature of it, demands of modern labour market for professionally-mobile and creative persons who possess communicative competence. In this case creating conditions for developing creative potential is treated with special attention. Familiarizing youth with global values, formation of skill to communicate with people of neighbor cultures within global space becomes an important goal of institutions of higher education. A significant part of population within multicultural area of Kazakhstan is bilingual. While enriching a student by heritage of two cultures, bilingualism put him into favourable conditions in comparison to a unilingual person. Due to the transition phenomenon, his native language and Russian come into a complex interaction. While comparing the two languages one can reveal complications, foresee and consider typical mistakes, comprehend nature and cause of mistakes, define order of mastering linguistic material in a consequent method. Teaching Russian in village schools, where basic social load is devoted to native language, can be efficient if it is based upon the latter. Studying native and Russian language, as one of strategic problems, defined by the Concept of developing education of Kazakhstan until 2020, guarantees achievement of educational goals due to familiarizing students with a different culture, history, literature, art, and science. Deepening in knowledge on native culture as a component of the integral world culture takes place at the same time. Knowledge of Russian is a linguistic capital, multiplication of which can guarantee certain economic profits. Russian language, along with state language, preserves total volume of functions as it is still used as means of accumulation and obtaining information, ideological influence, tool and object of education, component of spiritual culture of Kazakh society, and powerful means of communication. The essence of every language is defined by history, its present, and its future. The culture of Kazakh and Russian people is a component of school linguistic education. A new model of education, directed towards final result has been set as highest priority. The following positions are referred to key competences of a school graduate:

- formation of poli-lingual person who has mastered basic values of national and global literature, ready for social-cultural interaction;
- formation of competences, needed for communicating in domestic language and foreign languages, demanded in the society (Russian language is this axialiry language in our society).

Bilingual system is a system of education that forms intercultural competence, trains youth in tolerance and urge to understand the totality of multicultural and multilingual world society. How can

knowledge on different values, including social-cultural values, be presented within the structure of tutorial influence in order to have real forming effect in modern conditions? It is well-known that upbringing is a process of forming a personality, its character, feelings, ethical, and aesthetical ideals, culture of behavior. Any upbringing takes place according to social-cultural parameters of a given society and is defined by state policy and institutes of civil society that operate in the studied area. The term «social-cultural upbringing» has been introduced to the scientific use during recent years, and, as scientific definition, it includes all types of upbringing. The goal of social-cultural upbringing is to form and develop skills to carry out social functions of a civilian within a given society, train him to be competent in social-cultural features of his nation and society. Formation of personality, obtaining social-cultural form is a complex process, and many factors participate in it. Regulating contents of social relations in education is an urgent problem nowadays, when social-cultural activity, social environment, and relations suffer from numerous conflicts, and their dependence can lead to negative consequences. During mastering Kazakh and Russian language in school, students will familiarize with cultural achievements of two nations-bearers of these languages that certainly provides for development of their individual and social mobility. The very nature of two linguistic disciplines reviews transition of the accumulated experience of social-cultural achievements in order to help the youth in their self-realization and process of personal socialization. Democratization of Kazakhstan, humanization of relations, assimilation of cultures, integration of countries and societies enriches social-cultural relations with certain uniqueness, influences characteristic of social space that is distinguished by its cultural features. Forming a personality in modern conditions of interaction between cultures and languages actualizes a number of problems of social-psychological, pedagogic, methodical nature. Solving each of the mentioned problems and their realization is linked directly to social-cultural aspect. Multiplicity of subcultures is typical for modern civilized world. Through this variety cultural development of the society takes place, dominant values are formed as well as norms, standards of behavior, spiritual and cultural needs are met. Political, economic, social alterations of recent decades have resulted in linguistic changes. Kazakh language has obtained official status, a new linguistic situation has emerged, and it defines the necessity to form Russian-Kazakh bilinguality in addition to Kazakh-Russian bilinguality. Formation of Russian-Kazakh bilinguality is linked to a number of complications of linguistic, social, psychological, economic, and linguistic-didactic nature. Russian-Kazakh bilingualism implies equal good knowledge of two languages in order to establish an efficient bilingual communication. It

is important that students of linguistic classes are able to think, solve certain problems that lead to the process of brainstorming, justify on possible ways to solve these problems in order to analyze contents of their expressions, so that an idea is placed into central place, and language serves its basic function – formation and formulation of this idea. It is critical that students conceive language as means of intercultural interaction. During recent years attention of linguists, methodists, and practicing teachers is drawn to those features of language that are linked to human factor, particularly various aspects of intellectual and emotional life of a person. In this case consideration of social-cultural features of the society plays an important part in formation and development of bilingual personality of a student.

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MODULE APPROACH IN MODERN KAZAKHSTAN EDUCATION

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Science and higher education develop steadily according to world trends in Republic Kazakhstan. In 2010 Kazakhstan became the first Central-Asian state to join Bologna declaration.

Bologna declaration is not only unification of education period and diplomas, but, first of all, introduction of two new basic concepts: module approach towards education and credits into general-European system of education.

Bologna process is a possibility to overcome the settled local general-education stamps and stereotypes that are often justified by reasonings on national identity. At the same time, it is a door for Kazakhstan to exit national creek into the wide bed of international educational competition.

While entering Bologna process, we shall have to prove ideas on «indisputable advantages of our educational system» and the fact that «our graduates are wanted all over the world» to our international partners who are often and reasonably assured of the opposite. It points us to the necessity to improve programme contents systematically, develop new

forms and methods, master modern technologies of transiting knowledge. These measure need to be carried out not «on paper» of «for the report», but in order to stay competitive and hold our students from going to a different (European) university. The fight for consumer's preferences and competition are always healthy for business, and they prove to be most positive in terms of European integration.

Basic points of Bologna declaration (1999) can be broken down to five-six key positions, definition of which has been deepened and developed during the following years at forums of Salamanca, Prague, Berlin. In lapidary expression these Bologna agreements can be summed up as:

1. Levels of education.
2. Accumulative system of evaluating knowledge.
3. Unification of quality standards and increase in mobility.
4. Mutual acknowledge of national degrees by all countries-participants of the process.
5. Provision of the best employment to graduates according to the mastered profession and increase in attractiveness of Kazakhstan educational system.

Nowadays almost all economically-developed countries carry out a transition or have already transferred to realizing module programmes that are based upon competences. This approach is also significant for Kazakhstan, and its introduction can provide for producing qualified labour that is necessary for establishing a competitive economy.

The suggested approach towards module education differs from the traditional block-module method, used in Kazakhstan institutions of education, as complex mastering of skills and knowledge in terms of forming a certain competence that provides for carrying out a specific professional function that corresponds to demands of labour market, takes place within one module. It is important that development and realization of module programmes, based upon competences, implies presence of continuous feedback between requirements of employers and skills and knowledge of employees, as it defines training quality of the latter.

An important feature of module approach, based on competences, lays in flexibility of training programmes, because:

- They provide for individualization of training for each student according to his level of skills, knowledge, and previous education (or professional experience) via combining various modules.
- It is possible to use same modules in different educational programmes (such as safety technique, efficient communication, etc).

Other advantages of module programmes, based on competences are:

- As requirements of labour market alter, necessary changes can be quickly introduced into modules, or new separate modules of a programme can be replaced.
- Different training courses can be formed of various modules depending on demands of students

and their initial level (in other words, skills, knowledge, and experience, received from the graduation or professional activity).

It is important to outline that implementation of module approach towards forming programmes allows an institution to be in possession of an intellectual resource, this fact excludes the dependence of module realization on presence or absence of a tutor as methodic and materials can be mastered by a different specialist.

Module programmes, based on competences, influence only professional components of an educational programme and do not refer to general disciplines that are taught via traditional methods.

A central concept of this approach is the idea of competence that is defined as an ability to implement knowledge, skills, relations, and experience in everyday and new professional situations.

Thus, key aspect of a competence is an ability to carry out a certain activity, usual or new, according to organic integrity of skills, knowledge, experience, relations, etc.

Three basic competence types are outlined:

1. Technical/professional competences that refer to the area of professional activity.
2. «Mobile» competences that refer to social, communicative, methodical, or other competences that are required for an efficient professional activity in terms of different professions and fields of activity.
3. New basic (key) competences/skills that complement traditional key competences.

According to institutions of education that have taken module programmes into realization, their advantages are obvious and consist of:

- Ability to formulate goals and objectives of education clearly.
- Increase in training efficiency.
- Simplification of education process management.
- Broadening target groups of trainees.
- Increase in efficiency of personal activity and responsibility of trainees and tutors.
- Real individualization of training process.
- Increase in level of interaction between students and tutors/masters of productive training.
- Real preparation of students for their future professional activity.
- Increase in trust of social partners.
- Increase in flexibility of training programmes.
- Formation of productive culture within an institution.
- Formation of standard, objective, independent conditions of evaluating quality of mastering training programmes.

Thus, educational programme, structures into modules, must be clear and available for all users, and, first of all, students. A complete set of methodical documents should be developed for each module. They should include: TMC (training-methodical complex) of a module, TMC of separate disciplines, TMT (training-methodical textbook),

methodical guide for students and methodical recommendations for tutors. Module approach in complex with innovative technologies must provide an efficient solution of strategic problem of applied professional training – formation of professionals who are ready for active and creative operation.

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EDUCATIONAL AND RESEARCH COMPETENCE – THE BASIS OF LIFELONG LEARNING

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A strategy of the Volgograd state medical university aims to transform the university into a modern innovative center and it is realized in accordance with the Program of innovative development for 2013–2017 [2]. The progress along this path means involvement of each employee and a university student into the process of continuous education – «lifelong learning». It implies the relevance of educational and research competence development in students of medical university in the initial stage of vocational training.

Educational and research competence focuses the key trends of modern pedagogy – lifelong learning and competence-based approach as the basis of professionalism. At the same time this kind of competence is not emphasized in the Federal State educational standards for the specialties of a higher medical educational establishment. Thus educational and research competence will be formed not on the basis of the mastered educational and research competence, and while mastering of its elements presented in other competences.

Traditionally, higher education establishments focus upon the development of research competence, assuming that students have mastered the universal educational and cognitive skills at high school. However, as our studies have shown, this statement is true not for all the students. The analysis of the factors which impair the learning process, from the perspective of a student and an instructor, showed that a weak link in the initial stage of vocational training is reflexive and evaluation activity of students [1]. At the same time the development of educational and research competence of students is often not the aim of the educational process of a

specific department, and it is carried out in a background mode and is not reflected in the regulations and guidance documents. While designing the technology of educational and research competence development in students, along with developing methodological regulations, theoretical and process models, we paid special attention to motivation of conscious development of this competence in students by means of reflexive evaluation. The algorithm of reflexive evaluation fulfillment is tested at the Departments of Physics, Chemistry, Biochemistry with a course of Clinical Biochemistry, Department of Social Work with a course of Pedagogy and Educational Technologies of the Volgograd state medical university. The proposed approach of reflexive evaluation skills development in students was integrated into the system of educational activities of the department and therefore was perceived by medical students not as artificially created additional difficulties, and as a natural channel of feedback. An essential component of the technology is the use of the principle of a double goal-setting developed by us. It means that in the classes the educational goal is presented to a student in the guidelines, and the purpose of improving the academic skills is defined by the student independently, as well as the self-assessment of the achieved result which is carried out further. Already in the first years of study students have to pass consistently from educational and research activity (performing educational projects), and research laboratory works to research activity in scientific societies of the Departments integrated into the Scientific Community of Students and Young Scientists. And also the technology of educational and research competence development involves personality-oriented approach and assistance to every student in improvement of poorly mastered educational skills.

We believe that the involvement of students in conscious development of educational and research competence and the systematic use of reflexive evaluation for this purpose is a resource which enhances the quality of learning process (and, therefore, the quality of education), promotes professional and personal development of a future specialist and becomes the basis for lifelong learning.

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IMPLEMENTATION OF POLY-LINGUAL PROGRAMME IN HIGHER EDUCATION IN KAZAKHSTAN

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This article describes the development of a poly-lingual program in Kazakhstan based on the example of Kh. Dosmukhamedov Atyrau State University where since 2010 English language training has been introduced to pilot groups of teachers. We researched a number of curriculum areas taught by teachers enrolled in the pilot poly-lingual training programme. It was found that the number of credits awarded for bachelors the poly-lingual programme was minimal. Only 18 credits out of 71 available were awarded for language and specialist subject modules. The specialist modules were allocated only 5 credits for courses whose objectives were the preparation of highly qualified specialists with a knowledge of several languages. At the same time there was a successful training programme for teachers of English which opened in 2010 in order to promote the successful transition of the university to the poly-lingual programme. The results showed that the preparation of students for poly-lingual programme has a number of benefits, but problems which require addressing.

A poly-lingual programme can stimulate the study of humanities in the national educational system. The implementation of the cultural project «Trinity of languages» in Kazakhstan requires the development of three languages: Kazakh the state language, Russian a language of international communication and English the language of successful integration into the global economy. Learning a foreign language forms, communicative skills, which are necessary for a person as a member of society, a member of a team, a member of a family. It implies the ability to listen and to communicate. English as a medium of international communication occupies a leading position in the world.

Knowledge of Kazakh, Russian and foreign languages is becoming an integral component of personal and professional activities in modern Kazakh society for both personal and professional activities. All this creates the need for a large number of citizens who are proficient in several languages and who therefore have a real opportunity to gain a more prestigious position in society both socially and professionally.

The most important strategic objective of education in Kazakhstan is the preservation of the best of Kazakhstani educational traditions, whilst providing graduates with international qualification skills, developing their linguistic skills, which are the mastery of the State, the native and foreign languages.

The content of poly-cultural education is multidimensional and interdisciplinary and allows stu-

dents to consider the problems of poly-cultural education as a part of subject areas. Use by teachers of innovative methods, which will promote an interest in learning, duty and responsibility in training, will intensify the process of language training and promote efficiency of assimilation the Kazakh, Russian and foreign languages.

On instructions from the President of Kazakhstan, Nursultan Nazarbayev, since 2013, in the country's schools the study of English has begun from the first year. After 5 years, these students will learn modules delivered in English. By 2021 it will be necessary to prepare qualified personnel to carry out such work.

From 2010 the Atyrau State University has begun to train teachers in the English language and has been begun selecting students with a basic knowledge of English to further their training on an experimental basis for a number of specialties, such as 5B060800 – «Ecology», 5B011200 – Chemistry, 5B011000 – «Physics», 5B010900 – «Mathematics».

Aims. Foreign languages can be used to teach other disciplines. To achieve an international standard of proficiency in several languages, it is necessary to formulate the concept of poly-lingual education. It involves the formation of poly-lingual person by using a certain selection of content, principles of training, development of a special technique using poly-lingual phrasebooks, dictionaries and educational literature, which would indicate similarities and differences in basic, intermediate and new language learning.

The study aims to examine the introduction of poly-lingual programmes in higher educational institutions of Kazakhstan such as Atyrau State University. These studies are of practical interest, which will allow for further planning to take into account the shortcomings encountered and to make changes to the full implementation of poly-lingual education programmes.

Results. The poly-lingual person is an active speaker of several languages representing: the speech persona complex of the psycho-physiological properties allowing the individual to carry out speech activity in several languages simultaneously; the communicative persona set of abilities for verbal behavior and the use of several languages as means of dialogue with representatives of different linguistic societies; and an understanding of the outlook and attitudes of other linguistic societies,

Poly-lingual competence can be considered not only as a possession of several foreign languages, but also as the ability to learn foreign languages, knowledge of «a sense of language», and the desire and ability to independently learn foreign languages.

In order to increase interest in the study of foreign languages by university teachers, including English in Kazakhstan, universities have begun to open special departments for the study of foreign languages. In addition the government is working to attract teachers to university internships in for-

eign universities. «The State Programme of Educational Development of the Republic of Kazakhstan for 2011-2020» has given special attention to this problem». Since 2011: in the international scholarship of the President of the Republic of Kazakhstan «Bolashak» training will be provided for English language teachers of secondary, technical and vocational education, higher education ... It is planned that each year up to 2020 training courses will be held for 73,3 thousand people.

From 1993 to 2013 the 'Bolashak' International Scholarship was awarded to 10,025 Kazakhs funding their study on the top universities of 33 countries. For this purpose the center of the «Bolashak» international has awarded scholarships since 2011.

Atyrau State University joined this programme in 2009 and started to prepare for the transition to the poly-lingual system of education. Since 2010, it has run a number of specialist courses preparing specialists in three languages: Kazakh, Russian and English, in subject areas such as ecology, chemistry, tourism, etc. In order to educate students performed to a high level in the center has been opened to train poly-lingual educational personnel. Personnel from each had the opportunity to improve their knowledge of English by attending free classes at this center. In addition, five teachers were awarded the Bolashak international scholarship and trained at the University of Northampton (England) that will enable them to teach at the appropriate level in English.

For the purpose of scientific and methodological support poly-lingual education it has been necessary to amend the curricula and develop educationally methodologically complex disciplines in areas of training undergraduates in a foreign language, and to consider the use of foreign teaching materials on the subjects. In Atyrau State University of poly-lingual programme was introduced for specialties 5B060800 – «Ecology», 5B011200 – «Chemistry», 5B011000 – «Physics», 5B010900 – «Mathematics», 5B011100 – «IT», 5B050800 – «Finance», and 5B090200 – «Tourism». In order to study this programme students are tested in English proficiency and those students who gain the appropriate level of training continue studying a variety of modules in English. All students study common to all modules that make up the 15 credits, such as:

- Kazakh language (for groups of Russian speakers) or Russian (for groups of the Kazakh speakers) – B1 – Intermediate, B1 – extending average levels.
- Foreign Language (English) – B2-initial, continuing levels of B2.
- Specific professional foreign language.
- Kazakh language or Russian language for special purposes.
- General professional foreign language.

A list of specialty study modules on the poly-lingual programme:

Bachelors 5B060800 – «Ecology» study subjects such as Ecology of water ecosystems.

Assessment of an ecological condition of oil fields, Social ecology and sustainable development.

Bachelors 5B010900 – «Mathematics» – Equation of the partial derivative, Differential geometry and topology, Mat Lab, Mat Cat.

Bachelors 5B011000 – «Physics» – Computer methods in Physics, Electrodynamics AST.

It is interesting to note that the number of credits for the poly-lingual module make up a small part of the total available being only 18 credits out of 71 credits. Thus only 5 credits are allocated for specialized modules in English, the Kazakh language (for Russian speakers) or in Russian (for Kazakh speakers).

It is suggested the number of credits be distributed the following proportions: from 71 credits of components at the choice of the basic and specialized modules 15 credits are the share of the general for all specialties of module, then it is the share of specialized modules of 56 credits or till 17–20 the credits for modules of the corresponding language (Kazakh, Russian and English).

Table showing suggested credits for a Trinity of Languages Course

Language studies

- Kazakh for Russian speakers or Russian for Kazakh speakers

- English language 15 credits

Subject modules taught in a foreign language
17–20 credits

e.g. English/Russian/Kazakh sub-total 56 credits

Total for the complete course 71 credits.

Another problem is the time allowed for students whose level of English is low to study the language. Currently only about 10% who begin an English language course reach the required level and are able to continue their studies in this programme. The small amount credits allocated does not encourage them to continue until they have achieved the standard necessary.

Conclusions. The State language policy in Kazakhstan is regulated by legal documents, including the Constitution of the Republic of Kazakhstan, the Laws of the Republic of Kazakhstan «On Languages», «On Education», The State programme of functioning of languages in the Republic of Kazakhstan for 2011–2020. Concept of development of foreign language education of the Republic of Kazakhstan and others, which constitute its legal basis.

In terms of theoretical and methodological support it will be necessary to carry out research and educational research on the development of poly-lingual education. First of all, the creation of a scientific laboratory will be required. Its objectives would be an analysis of the language situation in educational institutions, the development of the conceptual foundations of multilingual education, the organization of pedagogical experiment to introduce training in three languages.

In conclusion, despite the difficulties and challenges of multilingual programme will prepare competent specialists acting as the main factor of economic and social modernization of our society and contribute to the achievement of the three objectives: knowledge of languages, outlook integration, education worthy citizens.

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FAMILY AS A PREDICTOR OF RISK OF FORMATION OF DISEASES IN ADOLESCENCE

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We presented the results of study of influence of medical and social predictors, including the psychological ones, on formation of diseases in children being brought up in incomplete families. It is established that higher educational level, professional employment of women cause revaluation of significance of family institute. The prevailing predictors of risk were revealed: irregular doctor supervision during pregnancy, lack of proper preventive actions, mothers' addictions in the antenatal period, high morbidity rate, including the diseases of nervous system of teenagers in the post-natal period. Among children from incomplete families the high level of hyperthymic, disturbing and timid, emotive and excitable types were found more often, which under adverse conditions can serve as «substratum» for formation of «marginal» psychopathies.

Keywords: incomplete family, teenagers, medical and social factors

Now in the Republic of Kazakhstan there is a stable tendency to increase in number of incomplete families, which is caused by various reasons. Among them are: family disintegration due to divorce of spouses, illegitimate birth rate, death of one of parents (in most cases the father) and others [1].

According to statistical researches, in the Republic of Kazakhstan the annual increase in number of divorces is registered: in 2009 – 2,45%, 2010 – 2,55%, 2011 – 2,71%. The number of marriages registered in 2012 made 9,88%, while the number of divorces of 2012 made 2,91% [2]. According to literature, in situations of divorce children suffer in the first place. Incidence of children from incomplete families is definitely higher, and their physical and neuropsychic development is worse compared with children from complete families [1, 3, 4, 5]. Current situation testifies to relevance of studying of health state of children from incomplete families. In the literature available, the number of the researches devoted to this problem is limited.

Research objective was studying of influence of the medical and social predictors, including the psychological ones, on formation of diseases in children being brought up in incomplete families.

Materials and methods of research

We surveyed 70 children (36 boys and 34 girls) from incomplete families at the age of 11–17. All children were studying in a grammar school of Karaganda. The comparison group was presented by 50 children from complete families, comparable by sex and age.

Inclusion criteria of children for research: teenagers of both sexes at the age of 11–17 being brought up in incomplete families.

Exclusion criteria of children from research: children being brought up in complete families, children from incomplete families with chronic somatopathies in a stage of subcompensation and decompensation, and orphans.

For all the children surveyed the following valid and reliable psychological methods of inspection were used: characterologic questionnaire (K. Leonhard, 2005), depression scale (S. Hathaway, J. McKinley, 2005), scale

of attachment of the child to the members of the family (E.S. Schaefer, R.K. Bell, 2005), personal scale of anxiety manifestations (J. Teylor, 2005), and projective drawing techniques. For the purpose of detection of detailed and complete information on risk predictors we developed and approved the questionnaire «Social and hygienic problems of the modern family».

Studying of incidence of the surveyed contingent was carried out by means of the retrospective analysis of history of a child development (form 112/y).

Statistical processing was carried out on the basis of the applied program of statistical processing «Statistica 6.0».

Results of research and their discussion

Received data testify that $45 \pm 7,9\%$ of studied families were incomplete because of the divorce of parents, in $27,5 \pm 7,1\%$ cases children were brought up by single mother, and the same number of families became incomplete due to the death of father ($p < 0,05$).

Peculiarities of social position of women nowadays are as follows: increase of educational level, professional occupation, independence and autonomy from men has led to revaluation of marriage institute. This is testified by obtained data. $82,6 \pm 5,6\%$ of single women had a high level of education ($p < 0,05$). In the comparison group this index amounted to $66,7 \pm 9,6\%$. Secondary education prevailed in the comparison group ($20,8 \pm 8,3\%$; $p < 0,05$), compared to the basic group ($6,5 \pm 3,6\%$).

During the research we analysed the index of professional employment of parents of the surveyed families. It was established that 100% of women from the basic group were professionally occupied whereas in the comparison group $54,2\% \pm 10,2$ mothers ($p < 0,05$) had a job. At the same time, when surveying $17,4 \pm 5,6\%$ mothers, who are not married, the low level of the income was pointed out ($p < 0,05$). It can be explained by the fact that the main source of the income in complete families was father's salary ($41,7 \pm 10,1\%$) and father's salary + mother's salary ($37,5 \pm 9,9\%$), while in incomplete families it was only mother's salary ($85 \pm 5,6\%$; $p < 0,05$).

According to the researchers, children from incomplete families are subject to acute and chronic diseases considerably more often than children from the complete ones [1, 3, 4, 5]. It is connected not so much with stress influence, but also with low alertness of mother about a state of health of children. Apparently, having become single, mother is bound to take care of the material aspect of wellbeing of a family to the detriment of traditional maternal duties of education and strengthening of health of children [3, 5].

After the poll of mothers it became clear that $4,4 \pm 3,0\%$ single women during pregnancy were not followed up by a doctor at all ($p < 0,05$). $82,6 \pm 5,6\%$ mothers from a basic group were followed up regularly during pregnancy whereas this index among the married women made $95,8 \pm 4,1\%$ ($p < 0,05$). In spite of the fact that the preventive direction in our country was and remains the fundamental principle of health protection of mother and child, it was established that in incomplete families $47,8 \pm 7,4\%$ addressed the doctor with the pre-

ventive purpose, while in complete families this index made $79,2 \pm 8,3\%$ ($p < 0,05$).

According to the research, in the antenatal period among future mothers the most common addiction was smoking, which, as we know, provokes a number of adverse effects: small-for-date fetus, increase in risk of premature birth, premature placental detachment [6]. During research it was revealed that presence of addictions, including smoking, is definitely higher among single women ($15,2 \pm 5,3\%$ against $8,3 \pm 5,6\%$; $p < 0,05$). From them $14,3 \pm 13,2\%$ could not give up smoking during pregnancy ($p < 0,05$).

The analysis of data of ante-, intra- and postnatal periods points to disorder and disturbance of central nervous system in the form of perinatal encephalopathy ($46,6 \pm 9,1\%$ against $20 \pm 10,3\%$; $p < 0,05$), residual cerebral organic insufficiency ($20 \pm 7,3\%$ against $6,7 \pm 6,4\%$; $p < 0,05$) and vegetovascular dystonia ($6,7\% \pm 4,6$, $p < 0,05$) which were authentically more often found in children from incomplete families in comparison with children from complete families (Fig. 1).

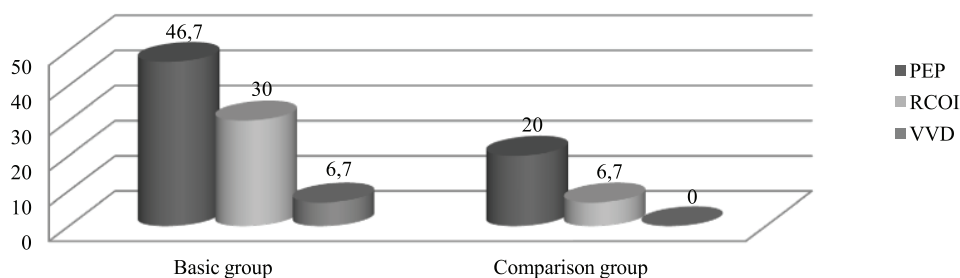


Fig. 1. Comparative index of disorder and disturbance of central nervous system (%)

One of the problems of our research was studying of accentuation of character among the surveyed children. It is well-known that accentuation, being intensively shown in teenage age, over time can be compensated and, under adverse conditions, – develop and be transformed to «marginal» psychopathies [7]. Therefore by means of K. Leonhard's characterologic questionnaire we tried to find out the prevailing accentuation of character of children in our selection. Results of the questionnaire (Fig. 2) show high percent of demonstrative type of character both in the basic group ($32,9 \pm 5,6\%$), and in the control group ($40,6 \pm 8,7\%$; $p < 0,05$). This results from the fact that in the majority of families, regardless of their type, children were brought up by the «family idol» type. Therefore, since childhood they got used to be the focus of attention, were extremely egocentric, felt the need for attention to themselves, sought to achieve admiration, recognition and sympathy by all means, and sometimes preferred hatred and indignation to indifference [7, 8].

As we can see in the chart, among children from incomplete families the percent of hyperthymic type of character was high ($21,4 \pm 4,9\%$; $p < 0,05$), for which characteristic is the reaction of emancipation, showing in the conflicts with parents and teachers, and especially amplifying at hyperguardianship and authoritative style of the treatment of the teenager [8]. The specified type of upbringing could often be found in incomplete families as mother, trying to be both mother and father for a child, chose the dominating hyperprotection upbringing type. The dominating hyperprotection also negatively affected children of disturbing–timid type ($5,7 \pm 2,8\%$; $p < 0,05$) because superguardianship aggravated their feeling of insecurity and feeling of insolvency [7, 8]. Along with it, we observed the emotive type of accentuation in children from incomplete families ($10 \pm 3,6\%$; $p < 0,05$), which manifested in high sensitivity and deep reactions in the field of emotional reactions.

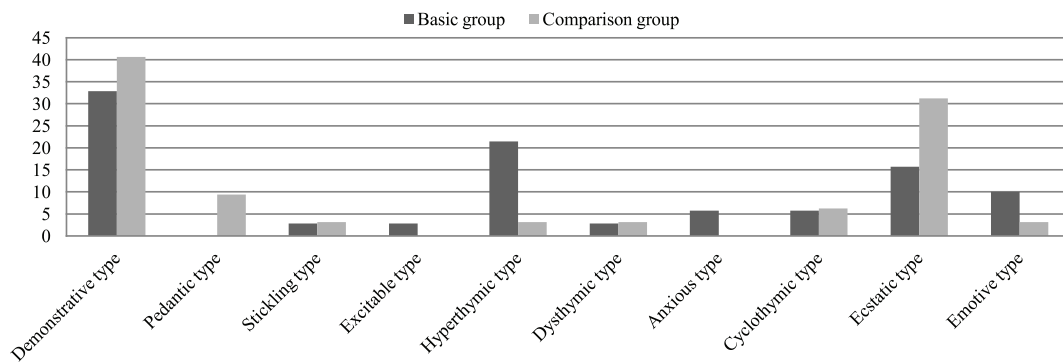


Fig. 2. Types of character accentuation of studied children (%)

It should be noted that, according to the researchers, children with the emotive type of accentuation have inconsistency between external «image» and «internal contents». Making an impression of «fragile, gentle and naive», emotive teenagers are more often in comparison with other types of accentuation were characterized by asocial behavior, making 36% [7]. At the same time, the group of an extra risk of asocial behavior includes excitable type of accentuation, this selection by results of our research was made by $2,9 \pm 2,0\%$ children of the basic group ($p < 0,05$) [7, 8].

According to the analysis of depression scale, personal scale of anxiety manifestations and projective drawing tests, it was revealed that in the basic group subdepression ($5,7\% \pm 2,8$; $p < 0,05$) and true depression ($5,7 \pm 2,8\%$; $p < 0,05$) were present, whereas in the comparison group only in $3,1 \pm 3,1\%$ children the slight depression (Table 1) was observed. The reason of it was the conflicts in a family, «superguardianship» by mothers, absence of care from parents, sense of guilt, inferiority complex, and all this was aggravated in the period of adolescent [9, 10].

Table 1

Presence of depression in children.

	No depression	Slight depression of situational or neurotic genesis	Subdepression or masked depression	True depression
Basic group	$81,43 \pm 4,65\%$	$7,14 \pm 3,08\%$	$5,71 \pm 2,77\%$	$5,71 \pm 2,77\%$
Comparison group	$96,88 \pm 3,08\%$	$3,13 \pm 3,08\%$	0	0

These children respectively have a higher level of anxiety compared to their peers, brought up in complete families (Table 2). High anxiety level in comparison group was observed in $9,4 \pm 5,2\%$ children, while in the basic

group anxiety level made $15,7 \pm 4,3\%$, and in $1,4 \pm 1,4\%$ children anxiety level was very high ($p < 0,05$). The reason for this was parting with one of parents, swift change of habitual situation, uncertainty in the future [8, 11].

Table 2

Anxiety level for children from incomplete and complete families.

	Low anxiety level	Medium anxiety level	High anxiety level	Very high anxiety level
Children from incomplete families	$52,86 \pm 5,97\%$	$30 \pm 5,48\%$	$15,71 \pm 4,35\%$	$1,43 \pm 1,42\%$
Children from complete families	$31,25 \pm 8,19\%$	$59,38 \pm 8,68\%$	$9,38 \pm 5,15\%$	0

Application of projective techniques of inspection allowed to obtain the following data (Fig. 3). In $14,3 \pm 4,2\%$ cases teenagers lived in an extremely adverse situation, that is the child

not only felt unnecessary, but really was rejected by parents ($p < 0,05$). The child constantly felt that he is a burden in life of parents, that without him they would feel easier and more free [7, 10].

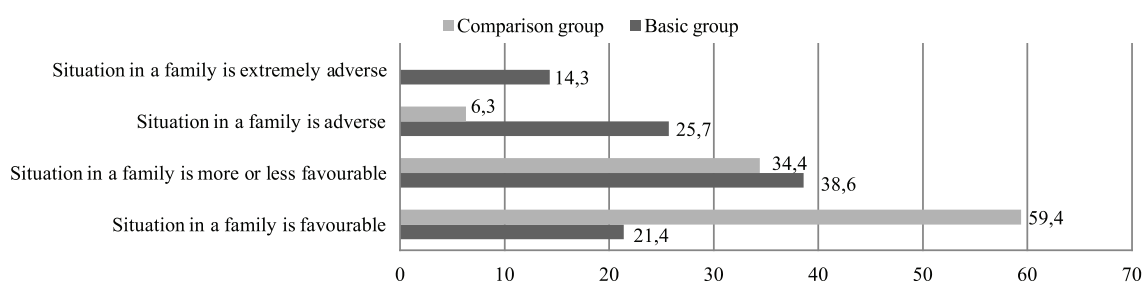


Fig. 3. Degrees of rejecting the child in a family (%)

One of important factors defining a state of health of the child in the postnatal period is being wanted [4]. During the research it was revealed, that among children from incomplete families $10,9 \pm 4,6\%$ were unwanted ($p < 0,05$). According to the researchers, the higher the isolation degree is, the deeper the spiritual wounds become and the more readily a person starts rejecting in order not to feel pain and humiliations. Desire to hide, feeling of uncertainty in society, discomfort from attention to his personality make him self-contained and unsociable [8, 9].

Also the fact that draws attention is that children being brought up without father since birth or since some moment later, were more attached to fathers ($5,7 \pm 2,8\%$), than children from complete families ($3,1 \pm 3,1\%$; $p < 0,05$). If a child continues to see the parent who left, or just remembers him well, he can communicate with this parent in his imagination in intervals between visits. And if a child does not remember the parent who left, he can reconstruct his image from what he heard about him, from what he admires in adults of the same sex he knows, and from those traits he would like to see in this missing parent [11].

Thus, in this work we presented the results of studying of influence of medical and social predictors, including the psychological ones, on formation of diseases of children who are being brought up in incomplete families. We established that the education level and, respectively, the professional occupation of single women are higher in comparison with the married women. Common incidence, as well as disorder and disturbance of central nervous system of children from incomplete families are definitely higher than in their peers from complete families. Probably it is caused by influence of various factors: the irregular doctor's supervision during pregnancy, absence of due attention to preventive actions, presence of addictions in mothers in the antenatal period, as well as unplanned pregnancy with the child. During research we established that among children from incomplete families there is a high level of hyperthymic, disturbing-timid, emotive and excitable types, which under adverse conditions can develop and be trans-

formed to «marginal» psychopathies. Teenagers from incomplete families are also notable for depression and high anxiety level. Probably that is connected with the feeling of inferiority, conflict situations in a family, sudden change of the dynamic environment after the divorce of the parents. Along with it, poor amount of mother's free time for the child owing to high business lead to formation of isolation of the child in incomplete families, and probably to formation of a certain «virtual» attachment to fathers. Proceeding from the abovementioned, we believe that the family not only remains an important significant predictor of risk of formation of somatopathies in adolescence, but also causes change of personal features, forming prevailing accentuation which in the absence of well-timed correcting actions can provoke formation of a «marginal» psychopathy.

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*Materials of Conferences***THE LATEST TECHNOLOGY AND METHODS OF HIGHER MEDICAL EDUCATION – PRIORITY OF MEDICINE IN UKRAINE**

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The latest technology of teaching students become the paramount strategic importance of development of medical science in Ukraine at the present stage. Implementation of the Bologna Process in Ukraine since 2005, focused on the creation of a European Higher Education (The European Higher Education Area, EHEA) to obtain the international European model diplomas.

Sequential phased system of obtaining a student of theoretical knowledge and practical skills in all higher levels (Bachelor → Specialist → Master) is evaluated and calculated on the basis of the European System of Credit Transfer (European Credit Transfer and Accumulation System, ECTS).

This single European credit system of evaluation of student's training is needed to implement the principle of mobility (to continue their education or work in any European higher education) to improve competitiveness, demand and employment of graduates of medical universities of Ukraine in the field of health care in Europe and other countries.

Such prospects of integration of medical science are impose significantly higher professional requirements to the modern teacher and to the modern student.

To a new level in higher medical education are being implemented basic fundamental didactic teaching methods for future highly qualified doctors. It's interactive and distance learning methods, teaching heuristics, pedagogical technique «brainstorm», intercollegiate on-line videoconferences, international student exchange programs, internships and various training courses, exchange of experience and participation in international medical congresses, forums, conferences, publishing articles in international medical journals with high citation index ISSN.

And a prerequisite for active participation in these events – is fluent in English and other foreign languages, the desire to consciously and actively develop the skills of self-education, self-help and cognition, constantly improve their cultural, moral and spiritual level.

Such grandiose opportunities to realize their professional and personal qualities can be realized through direct, active, conscious, full collaboration of all participants of the modern educational process, which aims to ensure high standards of medical education in Ukraine, Europe and worldwide.

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MODERN DIDACTIC'S PROBLEMS IN THE HIGHER MEDICAL EDUCATION TODAY

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In their professional activities, except their high spiritual vocation of humanity and need to meaningful pass descendants on their knowledge, teacher of the highest medical school at the present stage of development of society is obliged to meet the high rank of the teacher in a pristine sense of this word (from the latin «magister» – mentor, teacher).

As at all times, now is not enough to just be himself a highly qualified specialist in the field of medical science at the highest theoretical and practical level.

Modern teacher must be thoroughly familiar with the basic principles of pedagogical skills, which include fundamental knowledge, skills and abilities to form a clear, logical, sequential, successive, well-reasoned, evidence-based, transparent, credible, motivated, authoritative, and ideally even charismatic author's teaching methods craft of healing. That's why at the present stage of practical implementation of the theory of clinical training and medical education have already overdue objective need for each teacher not only higher medical, but also higher pedagogical education.

The basic laws of the receive, learning and knowledge transfer (interactive and distance learning methods, didactical Socrates heuristic, «brainstorm») a modern teacher knowing and applying in their professional activities every day and must constantly and creatively respond to the classic pedagogical questions of didactic (al-Gk. διδακτικός – edifying) – «What to teach?» and «How to teach?»

And for higher medical education characterized gradual integration of the «individual didactics» (teaching methods separate academic disciplines – anatomy, physiology, biochemistry etc.) for the formation of each student-future doctor the skills from the teacher or self-finding for analysisation, synthesation, systematization and presentation of their knowledge and practical skills.

This encourages the student's creative and their own clinical judgment for the subsequent implementation of the professional medical practice (surgery, therapy etc.).

The subject of modern didactic is the interaction of the teacher's learning process and the student's process of conscious cognitive activity for the mutual constructive resolution

of the problems: «Who, When, Where and Why to teach»? , because the doctoring it is a gift of God.

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MODERN ANESTHETICS CONTAINING BENZOCAINE FOR THE APPLICATIVE LOCAL ANESTHESIA IN DENTAL MEDICINE PRACTICE TODAY

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The ethylic ether of the paraaminobenzoic acid – Benzocaine (Anaesthezin, Anaestalgin, Topanalgin) was synthesized in 1890. Now this is quite active, low-toxic local anesthetic, insoluble in water, without resorptive action. Benzocaine is applied in the drug's forms of powders, 5–20% glycerol and oily solutions, 20% gels and spray-aerosols, ointments, 50–70% pastes solids for pain fabric tooth gels, tablets for dissolution in the oral cavity, and for the treatment of the stomatitis this drug combining it with hexamethylenetetramine in stomatological dentistry.

Benzocaine Drugs – Topical paste (Product Deentaries SA, Switzerland), Ultracare (Ultradent), Gelato (Deepak Products Inc.), Dentol (Pharmascience Inc, Canada), Jen-Relief (Jendental Inc., DentMarket, Kyiv, Ukraine), Gingicaine Gel (Belport Co, Gingi-Pask, USA), Topex (Sultan chemists inc., USA), Ez Gel A (PE-Izimediks Kiev, Ukraine – Canada), Ezmedix EZ Gel-A (Ezmedix), Topicale® Xtra (Premier Dental, Canada), Premier Topicale Gel (Premier Dental, Canada) – have a nice taste by cherry, orange, raspberry, strawberry, strawberry, pina-colada or mint, and do not have a local irritant in the mouth.

The appearance of negative side effects possibly due to exceeding the recommended doses or in individual hypersensitivity to Benzocaine.

The applicative local anesthesia in dentistry used to anesthetize the site prior to injection anesthesia, before the excision of the gums and removing hypertrophied papilla, if gums and dentin hypersensitivity, deleting temporary occlusion of deciduous teeth, removing the teeth of the third degree of mobility, during a simple curettage, abscesses's opening, in the treatment of ulcerative stomatitis, remove tartar, to suppress the gag reflex when removing the cast and conducting radiological examinations, for quick removal of the pain of teething children (from 4 months of age – gum's gel 7,5% Dentol).

This intraoral local applicative (surface or terminal) anesthesia in modern dentistry refers to non-injecting medication methods of local anesthesia,

use of which ensures the greatest comfort for patients, which is particularly important in pediatric practice, and success of the whole process of outpatient and inpatient treatment.

Comfortable painless dental procedures carried out is an important criterion of modern professional rating practitioner dentist, in private dental medicine practice especially today.

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BREAST CANCER AND RADIATION RISK IN SEMEY REGION

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As show the results of years of research conducted in contingents exposed to prolonged high-ionizing radiation (such as nuclear bombing tests and disasters), the negative effect of irradiation is not confined to the direct effect on the treated. Nor is it possible to explain the peculiarities of morbidity in regions subjected to the effect of radioactive fallout by the presence of known hereditary (genetic) defects. There is a hypothesis that the increase in prevalence of several diseases in the descendants of exposed persons may be associated with poorly understood complex of minor genetic changes manifested at the level of regulatory systems dysfunction (nervous, endocrine and immune system, to a certain extent). One manifestation of this disregulatory complex may be the increased frequency of malignant tumors of hormone-dependent tissues in the descendants of exposed individuals. At the moment, there has been revealed a considerable number of genes that are predictors of various diseases, including cancer.

In terms of malignant neoplasms, modern epidemiological situation is characterized by reduction in the incidence of a number of previously highly-common tumors and increase of hormone-dependent tumors, especially those of female reproductive system organs. Breast cancer is in the first place in the structure of cancer incidence in women. Prognostically, breast cancer is favorable when it is timely detected. Unfortunately, in many cases there is a late detection of cancer associated with a greater risk of recurrence and metastasis after specific treatment. Several studies indicate the link between breast cancer and exposure to ionizing radiation. In particular, the increase in cancer incidence was detected in the areas of radiation risk at the Semipalatinsk Test Site (SNTS) that remains under the attention of researchers. There have also been identified peculiarities of genes-predictors prevalence associated with exposure to ionizing radiation, not only in directly exposed individuals, but also in their descendants.

Materials and methods: we studied the frequency of breast cancer in the region of the Semipalatinsk nuclear test site in view of the radiation risk zones in comparative perspective (for the period 1971–2011, according to data provided by the Department of Health of the former Semipalatinsk and Eastern Kazakhstan Province).

Research results: throughout the period analyzed, the incidence of breast cancer had a significant upward trend. The cumulative value increase from 1971 and 2006 amounted to 5 times (from 5,2 to 26,2 per 100,000 people a year). From 2006 to 2011, no significant changes in the incidence have been identified. Throughout the study, trend indicator was directed upward, indicating a continuing trend to its further increase.

There were significant differences in the radiation risk zones. The peculiarity of this indicator in the area of extraordinary radiation risk is a significant excess of its average value for the region and the republican average, existing throughout the whole period of study. A similar but less pronounced trend was found in the zone of maximum radiation risk.

The main feature of breast cancer incidence in the area of minimum radiation risk is its gradual growth, generally corresponding to the average national rate trends.

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VASCULAR ENDOTHELIUM DISORDERS AT THE MALIGNANT TUMORS AND CHRONIC IONIZING RADIATION

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Malignant neoplasms of rectum are among the most common diseases. Despite the relative simplicity of the diagnostics, the possibility of hidden course and frequency of metastasis causes significant frequency of inoperable forms undergoing conservative treatment (radiotherapy and chemoradiotherapy). In most cases, patients have systemic complications of oncological process, manifested by thrombosis and suppression of the immune system with a predisposition to infectious processes. Although the genesis of these complications has been studied for a long time, it has not been fully explored yet. State of the vascular endothelium is relevant as a potential modifying factor in the genesis of malignant neoplasm complications in persons exposed to ionizing radiation during their lifetime (due to the activity related to SNTS – Semipalatinsk Nuclear Test Site).

Objective: To determine the characteristics of endothelial factors in colorectal cancer in people subjected to the effect of ionizing radiation.

Materials and methods: two groups of people with colorectal cancer malignancies + control group. Methods of endothelial function study: the content of exfoliated (circulating) endothelial cells in peripheral blood; the content of NO metabolites (NO met.) in the blood; endothelium-dependent vasodilation definition (EDVD).

Research results: there were revealed statistically significant differences in terms of the circulating endothelial cells content in peripheral blood between the groups. The excess over the control group was the most pronounced ($M2M1 = 2,23$; $M3M1 = 3,40$). Excess of this indicator in patients with radiation history proved to be significant ($M3M2 = 1,53$). We can suggest the likelihood of vascular endothelial lesions in exposed individuals before the onset of tumors or that aggravating the effect of tumor process on the state of endothelial cells. Content of NO metabolites in the blood of the examined patients was increased; its average values in the group of irradiated patients were lower than those in the comparison group ($M2M3 = 1,08$). Given the important role of NO in the regulation of aggregation and spontaneous platelet disaggregation process, it must be assumed that the relative decline could play a role in the sharp decrease in the disaggregation activity.

According to the mean values of EDVD degree, $M1M2$ differences amounted to 1.46, $M1M3 = 1,96$ and $M2M3 = 1,34$. Thus, all obtained instrumental and laboratory data confirmed the presence of endothelial dysfunction in patients with malignant tumors of the colon and rectum and its greater degree in those with a history of chronic ionizing radiation.

Thus, signs of endothelial dysfunction, reduced endothelium-dependent vasodilation and increased amount of circulating endothelial cells in the blood levels is common to both groups of patients examined, with and without ionizing radiation exposure history. There are differences between the groups of patients depending on the effects of ionizing radiation. The exceeding extent of vascular endothelium damage regularly appeared in individuals with malignancies, previously exposed to radiation as a result of living in areas of SNTS radiation risk.

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THE CANCER INCIDENCE IN SEMEY REGION OF KAZAKHSTAN REPUBLIC

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The problem of morbidity and mortality from cancer is one of the most topical problems in modern medicine, as it affects the interests of all

mankind. WHO predicts that by 2020, the morbidity and mortality from cancer will increase by 1,5–2 times worldwide. The Republic of Kazakhstan is characterized by a similar trend of cancer incidence growth, taking into account the welfare and life expectancy, as well as increased detection of malignant tumors with the introduction of early detection programs. Mortality from cancer in Kazakhstan ranks second in the structure of mortality; about 17,000 people, of whom 42% are people of working age, die of cancer each year. During the last twenty years, the absolute number of cases of malignant neoplasms in the Republic has increased: in 1998 there were reported 28,322 diseased persons, whereas by the end of 2011, their number had risen to 30,299. The annual growth in the number of patients with malignant neoplasms is 5%. Mortality from malignant neoplasms in the last twenty years has decreased from 130,8 per 100 thousand people in 1998 to 101.6 per 100 thousand people in 2012. Reduction in mortality is associated, primarily, with the improved diagnosis of malignant tumors in the early stages and the effectiveness of outcomes.

We studied the incidence of malignant neoplasms in the population of Semey region of East Kazakhstan Province during the past 20 years.

The average annual intense incidence rate of malignant neoplasms by periods has increased from 200,6 ‰ (1991) to 216,8 ‰ (2012). To a greater extent, the maximum increase in incidence of Semey region (EKP – East Kazakhstan Province) for 1991–2012 was caused by increased risk of illness, marked in lung, breast and stomach cancer, colorectal cancer, malignant tumors of the skin and cervix.

Incidence of malignant tumors in the Semey region in 1991 in males was 126,5 ‰, in females – 163,8 ‰; the year of 2012 showed a trend toward increasing – 213,2 ‰ and 220,2 ‰/0000. In this case, the leading positions in the structure of incidence among men are occupied by tracheal, bronchus and lung tumors – 22,7% (1991–26,9%), and gastric tumors – 15,1% (15,0%); colorectal cancer in males moved to the 3rd position – 9,3% (5,6%), displacing the incidence of esophageal and skin cancer – 6,9% (7,0%); followed by 6,4% (3,8%) incidence of hematological malignancies and malignant tumors of the prostate gland – 5,1% (0,9%).

The first place on the prevalence of cancer in the female population belongs to breast neoplasms – 22,0% (1991 – 13,3%), second and third place is occupied by cervical cancer – 11,9% (2,6%) and colorectal cancer – 9,6% (6,7%), surpassing the malignant skin neoplasms – 8,2% (11,8%), stomach cancer – 6,4% (11,1%) and hematological malignancies – 6,4% (3,9%).

Thus, the analysis of morbidity and mortality from malignant neoplasms shows a tendency to their overall growth. It is well established that lung cancer in Semey region consistently ranks first in morbidity and mortality mainly in the male working population, which has socio-economic importance.

A persistent increase in tumors incidence of the gastrointestinal tract is observed. Breast cancer is one of the most frequent causes of death in women as compared with other forms of cancer.

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THE EXPERIMENT OF CREATION OF BONE ANATOMIC PREPARATION FOR CRANIOMETRY FOR SCIENTIFIC PURPOSES

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Purpose: To determine and choose the most suitable method of creation of the bone preparation in scientific laboratory setting.

Material and methods: 5 fetuses corpses (16–20 weeks) were provided by the maternity ward «Municipal Hospital № 1» in Severodvinsk. The creation of skull preparation was based on a simple maceration method in the scientific facilities of the Department of Human Anatomy of the Northern State Medical University. The study design was reviewed and approved by the local ethics committee of NSMU (protocol № 02/3-13 on 20/03/13).

Results: Preparation of skeletons with preserved ligaments of embryos, newborn and early-age children requires special equipment and skills. After analyzing the literature, some methods, which are based on using of special thermostats and the involvement of additional microorganisms, were excluded. The most suitable method of creation of bone preparations in this case was the way of maceration, i.e. maintaining the bones for a few months in the warm water in a closed vessel. Corpses used in this experiment were previously fixed in formalin, and therefore, they were previously briefly immersed in a weak solution of hydrochloric acid prior to maceration. Then the preparations were immersed in warm water in a vessel covered with a lid for access of air. After 4 weeks sawdust were added into the water to improve the decay. During next 3 weeks the process of maceration was extremely slow, so we mechanically cleared skulls from the soft tissues without damaging the bone. Then preparations were put in warm water with sawdust again to complete the process of decay. 28 days later the preparations were washed with running water and were put into a 20% solution of hydrogen peroxide for bleaching. The result was obtained in one day.

Conclusion: As a result, we got the high quality fetal bone preparation for craniometry using the maceration, in scientific laboratory setting. This

process was time consuming (4,5 months) and required a combination of different techniques.

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EVIDENCE BASED MEDICINE AS AN INSTRUMENT FOR THE STUDY OF INTERNAL MEDICINE

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The present time the proper medical practice, healthcare organizations and research activity requires the ability to critically and competently evaluate the results of the latest scientific and clinical research. It is necessary to stimulate the clinical and scientific thinking of the students, the use of interdisciplinary approaches for the acquisition of knowledge and skills. Currently, evidence-based medicine is a mandatory educational discipline for the third year students in accordance with Kazakhstan educational standards. Semey State Medical University actively implements of the method of integration of disciplines «Internal Medicine» and «Evidence-based medicine» to improve the skills of students in determining the optimal methods of diagnosis, treatment and prevention of disease in a particular patient in a concrete situation. The forms of such integration could be different. They include

1. Selection of optimal methods of diagnosis, treatment, prevention using case based learning method (CBL). In the clinical department the students under the guidance of teacher perform examination of the patient, an analysis of the examination results, define the clinical problem and discuss the reasonable tactic for examination and treatment. Then they confirm their opinion using the databases of evidence based medicine. For the searching of the necessary information the students use method (patient/population, intervention, comparison, outcome), define the key words to search the proper scientific based information in the different data bases including PubMed, MEDLINE, EBSCO, International Clinical guidance. Our students have very good possibility to use The Cochrane library. Then the students demonstrate the found information, discuss it and analyze the results of work.

2. Using the knowledge of evidence-based medicine in the independent student work for the description of clinical cases, presentations and essay.

3. Demonstration of knowledge in the clinical conferences and clinical symposia for discussion the most difficult and controversial clinical situations. In this case, the assessment of evidence-based

medicine knowledge and skills is held by the expert in the field of evidence-based medicine

Analysis of the feedback from the students showed that almost 100% of them said that integration of evidence-based medicine and internal medicine is helpful to improve their knowledge and understanding in the field of study, research skills, critical and clinical thinking, 80% said that such learning improves their communication skills and teamwork skills. Only 10% of students reported difficulty in finding of relevant information due to lack of good knowledge of English.

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THE ROLE OF IMMUNE CELLS IN CARCINOGENESIS OF HPV ASSOCIATED ETIOLOGY

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There are on the basis of their own data presented a comparative analysis of the existing model of carcinogenesis and the author's model in the work, as the development of Correa (1998). Author's concept involves etiopathogenic factors for all effects of neoplasms of any nature, causing activation of proliferative activity and apoptosis leading to the depletion of the Cambium tissue. The authors acknowledge neoplastic processes local changes that are not related to changes in the genome of cells and induced when control of effector immunocytes processes of cell proliferation and apoptosis leading to generalized changes in the body, and secondary immune deficiency. Author's model of carcinogenesis based on data from the literature and own data involved in the formation of tumor blood stem cells migrated to the zone of damage may not initiate signalling molecules, and other effects, including the bioelectrical signals. The authors suggest that the local main damage cells even before the first clinical and morphological characteristics of leading cancer in humans, cause the start of generalized process violations in the regulation of differentiation and specialization of blood stem cells, circulating in the body, followed by the development of secondary immunodeficiency. Migration of blood stem cells, leaving them in the area damaged by the physiological tissue and inability to query a differentiation in the changed circumstances of the situation also involved a change of contact interactions. Reparative regeneration occurs with an attempt

to close the defect without specialized tissue barrier function.

Relevance. According to Zur Hausen H. (2008–2012) as well as the majority of supporters of the virus theory of cancer, human papillomavirus (HPV) is now recognized as the primary etiologic agent of carcinogenesis. Narisawa-Saito M., Kiyono T. Et al. (2007–2012) indicate a high mortality from HPV infection, and believe that the human papilloma is the main cause of the development of neoplastic or malignant neoplasms of cervix; types 16 and 18, which relate to the high-risk strains of carcinogenesis, are present in more than 90% cervical carcinomas. Many authors suggest that the viral genes HPV E6 and E7 play a major role in epithelial malignancy, as they contribute to the degradation of p53 and disrupt the complex formation of transcription factors, inducing multistage carcinogenesis. The availability of carcinogens, proliferation's dependence on estrogen as well as WHO's recognition of HbP being the cause of carcinogenesis in the stomach, provide grounds to believe that the solution to the mechanisms of carcinogenesis is to be found in the future. At the same time, the analysis of immune cells interaction in the mechanisms of neoplasia and the role of effector immune cells have been insufficiently studied. Spontaneous recovery in 98% of *papilloma virus* cases, Hb pylori carrier state in 95% at 10% developing ulcers and 3% getting cancer, suggests that the key pathogenetic process of oncogenesis is yet to be found.

The aim of our study is to analyze the models of oncogenesis and develop the author's model based on an existing neoplasia algorithm provided by Correa (1998).

Materials and methods. Research data from 2000 to 2013 served as materials for the analysis, containing information on carcinogenesis in various human organs. We also used the results of own research of skin with human papillomavirus infection and reparative regeneration after the burn, as well as mucous membranes of the gastrointestinal tract of humans at ulcerative processes, metaplasia and cancer.

Own research results. The analysis of data on the regeneration process in the burn wound area showed that the migration of leukocytes and undifferentiated cells transforming into fibroblasts with protective and synthetic function for the formation of matrix and substrate for epithelial migration contribute to covering the tissue defect. In this case, restoration of an epithelial layer occurs through the restitution of the burn wound edges as well as through the cambium of hair follicles and sweat glands. It was found that burn wound's infection with staphylococcus, despite its high pathogenicity and purulent fusion of tissue, results in reparative regeneration with repairing of epidermis at burns surface, even at significant decrease in patient's immunity. At the same time, the reparative regeneration may be of pronounced hypertrophic character, or accompanied by the formation of poorly ren-

dered normotrophic scar, in case burn wound area is minor. According to our data, in case of HPV infection, first there is an increase in mitotic activity of cambium keratinocytes of the basal and spinous layers, which is consistent with the results of Borgogna C., Lanfredini S., Peretti A., et al. (2014).

The epithelial layer's adaptation to the HPV consists in amplified proliferative activity of epithelial and connective tissues, hyperkeratosis, as well as the formation of papillomas, represented with outgrowths of epidermis and underlying connective tissue. The HPV tropism to cambium cells and triggering of apoptosis in the epidermis as well as the subsequent destruction of cambium cells lead to the impossibility of restitution in the damage zone. In the absence of spontaneous recovery or in case of long-term infection with HPV, there is a formation of necrotic foci and later – cysts with blood infiltration. Cysts are characterized by the fact that the apical surface of skin retains shiny and corneous layers. There are no granular, tubercular and basal layers. The damage of cambial layer that has a regenerative potential leads to a lack of basement membrane, as it is a derivative of the basal cells and those of underlying connective tissue. Therefore, the basal part of the cyst has no clear outlines. In the epidermis adjacent to the lateral surface of the cyst, total apoptosis takes place. Cyst cells are presented with a pool of cells morphologically identical to blood cells in leukemia; they have numerous figures of abnormal divisions, such as holoschisis and polycentric mitosis. A portion of the fibroblast-like cyst cells produces fibers organizing the structure of cyst; from liquid, it acquires a more dense texture, filled with undifferentiated cells and intercellular substance. Regeneration results in closure of the defect without performing barrier and protective functions inherent in epithelial tissue. The lack of cambium, which generates growth factors of lymphocyte differentiation, leads to the impossibility of cells-migrants' specialization. There is a decrease in the amount of CD68 cells in the area of expanding tumor as well as an increase in peripheral blood, CD68 cell migration from the epidermis to the connective tissue adjacent to the damage area, and the loss of epidermis restitution abilities, suggesting an explicit dysregulation in the epidermis regeneration process. Cystic formation, emerging in the zone of epidermis damage filled with cells-migrants with numerous abnormal mitoses and cells with morphological features of fibroblasts, show that carcinogenesis is not associated with dysregulation of gene expression and accumulation of epigenetic abnormalities in cambial keratinocytes.

One of the gastric carcinogenesis hypotheses provided by Chiariotti L., Angrisano T., Keller S., Florio E., Affinito O., Pallante P., Perrino C., Pero R. and Lembo F. (2013) suggests that Hb pylori interaction with gastric epithelial cells triggers epigenetic reprogramming, leading to genomic instability, just as in HPV infections, thereby causing

tumor growth. Study of the dependence of stomach ulcers and malignancy development on strains with high pathogenicity genes, such as *cagA* and *vacA* associated with carcinogenesis, showed the same shifts of CD cells number in the local immune homeostasis of mucous membrane in the pyloric, fundal and cardial section of the stomach. In our opinion, this may indicate that the key role in the pathogenesis of gastric ulcers and carcinogenesis is played not by the pathogenic agents, but the state of local immune homeostasis of the gastric mucosa, providing barrier properties of the surface epithelium. Preceding carcinogenesis atrophy of the gastric mucosa indicates the common mechanisms of carcinogenesis in tissues of various organs, and does not endorse the view on the absence of apoptosis in tissue malignancy. In our studies, total apoptosis and atrophy precede carcinogenesis.

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FEATURES OF ATOPIC DERMATITIS IN CHILDREN WITH HERPES INFECTION

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The purpose of the study: to study the frequency of infection in children with atopic dermatitis herpesvirusnomy infections, a study of the psychological characteristics of status. Material and methods: in the clinic in the department of dermatology TashPMI were examined 35 children with a diagnosis of «atopic dermatitis» in age from 1 to 7 years. The complex studies of sick children were included traditional methods, PCR diagnosis of peripheral blood was determined by dermatological quality of life index, the index of itching. Conclusions: In order to correct pathology therapy were included Cyclopheron, Gipovin. To correct the psychological status was used Adaptol. Results: 19 patients were diagnosed AIT, a 17 – set changes in the psychological status.

Atopic dermatitis – a multifactorial disease in most cases with a hereditary predisposition, having a chronic relapsing course with a certain age evolutive dynamics characterized by itchy eczematous and lichenoid eruptions, as well as abnormalities of cellular immunity in the skin with dysregulation of T-cell immunity strength. In children with AD usually occurs early in life and is characterized by severe severity of clinical manifestations, chronic recurrent nature. The disease often manifests continuous flow (without remission), frequent complications and worsening of the skin process. Known combination with various AD, including infectious diseases [7].

Allergic diseases have a high share in the structure of human disease. Very often, both in children and adults occurs – Atopic dermatitis (AD). In the

world of this disease suffer from 3% to 15% of children from 2 to 10% of adults [8, 10]. In the general structure of dermatoses AD is from 5 to 30% [4, 5, 6, 7], infant morbidity structure – from 20 to 66%. Currently, there is a significant increase in the incidence of atopic dermatitis in children, which is manifested in 90% of children in early childhood, treated by a dermatologist. [8] Numerous recent studies have shown that AD identified in childhood still persist in 45–60% of adult patients. These data suggest that AD is one of the very significant health problems.

Psychological disorders in patients with chronic skin diseases recorded in 30–40% of cases and are relevant subjects for the study, analysis and discussion.

Previously, it was suggested that psychosomatic factors play an important role in dermatological diseases. According J.W. Ironside (1994) – the body vulnerable to psychosomatic illnesses, under the influence of several etiological factors, including genetic predisposition and constitutional. There is a view that emotional factors managed CNS include intrapsychic processes such as self-esteem or identity of the body, which in turn is subject to «conversion» due to emotional arousal associated with intrapsychic problems, social factors determining the state of the body [9].

It is known that mental stress is associated with increased levels of opioid neuropeptides and amplifies certain dermatological conditions which are psychosomatic and immunological component type psoriasis, chronic idiopathic urticaria, allergic dermatitis. According to V.V. Nikolaeva, any chronic illness puts one flowing into the specific conditions of life, which include: the need for adherence, diet, perform various medical recommendations stimulated limiting contact with people, sometimes – the difficulty in performing professional activities, maybe even access to disability. The study of all these conditions may contribute to the understanding of some mechanisms of identity formation, which in turn is necessary for solving the problems of prevention in individual psychologically pathological personality development. With AD, early onset, chronic long-term course of the disease with periodic exacerbations, resistance to therapy, the need for dieting, painful subjective experience itching, constant feelings of discomfort experienced by patients when communicating with others, lead to the development of the specific identities of these patients [6].

Currently, AD is also referred to as psychosomatic illnesses, as well as patients with clinical manifestations of the disease and experiencing psychological problems.

Herpes simplex, especially its relapsing form belongs to a group of dermatological diseases, depending on the psychological stress and is a disease in which dominate psychosomatic disorders as a result of the reaction of the person on recurring throughout the process. Many consider this disease,

especially in combination with other important social problem, since there is a malfunction in the patient's life. Children suffering from atopic dermatitis, usually later in life become selfish and gradually transformed into the hidden, repressed people [4].

Thus, in the pathogenesis of a variety of skin diseases leading position as trigger factors occupy psychosomatic disorders associated with the life of the sick in the family, at school, in the team, during outdoor activities affecting the course and severity of the clinical condition, and in some cases exacerbate clinical dermatosis.

The aim of our study was: to study the frequency of infection herpesvirusami children with atopic dermatitis and features a study of the psychological status of children with atopic dermatitis, infected with herpes. In the department of dermatology clinics TashPMI hospitalized were 35 children with a diagnosis of «atopic dermatitis» in age from 1 to 7 years, among them girls – 21 (60%), boys – 14 (40%). Duration of the disease in almost all cases corresponded to age. Patients had the following forms of AD: erythematous form observed in 11 (32%) patients; erythematous-squamous – in 9 (26%); prurigenoznaya – 7 (20%); erythematous-squamous with lichenifikatsii – in 5 (14%); lichenoid – 3 patients (8%). Seasonality in the course of the disease was observed in 27 (77%) patients, worsening of the disease was more common in cold weather. Among the factors causing exacerbation of parents of sick children in the first place indicated – non-compliance with hypoallergenic diet – 18 (51%), infectious diseases – 7 (20%), contact with household allergens – 5 (14%), as possible causes of acute noted stress, intake of medicines.

Cutaneous manifestations of dermatitis characterized by typical morphology and localization of lesions (face, neck, trunk, flexor surfaces of the limbs). The clinical picture is dominated by symmetric erythematous-papular rash with a penchant for grouping with small-and sredneplastinchatym desquamation; foci of infiltration and lichenification, excoriation linear or point; hemorrhagic crusts. White spilled autographism detected in 58% of patients, mixed – 27%, pink – 15%.

The complex research of sick children were included traditional methods of research – clinical analyzes of blood, urine, coprogram, ultrasound of internal organs, if necessary, the patients were examined by doctors related specialties. All children were also screened for infection AIT, which was used for the diagnosis of molecular biological method for determination of herpes viruses – polymerase chain reaction (PCR). As a material used peripheral blood.

In assessing the condition of the patient is very important to identify the negative impact of chronic skin disease on the life of the patient. To determine the severity of disease in patients at the beginning and after 1 month of treatment. use child dermatological quality of life index (DDIKZH). As

the main symptom of the disease was assessed subjective itching of varying intensity with the help of the index itching (PRURINEX) (younger children PRURINEX installed by surveys of parents). The average value of the index was 3,8 points itching. Expressed itch was observed in 28% of children with persistent and prolonged course of AD.

Findings. In assessing the clinical tests have observed children attracted attention: severe anemia (31%), neutropenia (20%), lymphocytosis (27%), increased erythrocyte sedimentation rate (22%) in the aggregate, these results indicate the presence of inflammatory process with a marked reduction in immunoreactivity in children. Of comorbidity in patients with AD was dominated by children respiratory disease, occurring with an allergic component (48%), diseases of the digestive system (36%), cardiovascular system (7%), kidney (6%), nervous system (5%). Studies have revealed the examined children following forms of infection: HSV-1 in 12 (63%) patients, HSV-2 – in 5 (26%), cytomegalovirus in conjunction with HSV 1,2–2 patients (11%), in other sick children PCR revealed no infectious pathology. Thus, 19 (54%) children have been infected with HSV. In 17 (89%) patients were held definition of psychological status (children under 4 years due to the inability to identify and select the answers count data was not performed). In calculating the average value of the index DDIKZH equal – 20,3, where the minimum value of the index – 6 points, and the maximum – 30 points. Higher rates DDIKZH observed among children with prolonged and persistent course of dermatosis and severe clinical manifestations.

Study playback of various objects: House, Tree, Man (BCD) allows to assess the psychological state of sick children in chronic diseases flowing: 3 (17%) children had a feeling of alienation, of rejection, 7 (41%) – had complicated family relationships, internal stress and a lack of positive emotions in the house, 9 (53%) patients experienced anxiety and fear, difficulties in interpersonal relationships.

We found that the details of the image of Man also express the emotions of the patient level, as figures 12 (63%) patients showed children insecurity and cowardice, timidity and experiences.

Proportioned figure with respect to a piece of paper mean psychological significance, importance and value of things or relationships that are symbolically represented in Figure BCD. Very small size of the picture in 15 (77%) children reflect distrust of self and a sense of inferiority.

Symptom test BCD expressed in varying degrees, most often were marked manifestations such as insecurity (30%), anxiety (24%), conflict (32%), feelings of inferiority (22%), hostility (20%) was less than the characteristic distrust of self (12%).

Children with AD received conventional therapy (antihistamines, calcium supplements, enzymes, etc.) in patients with AIT regimen included Gipovin 10 mg/kg (valacyclovir hydrochloride) (7 days) or

by TSikloferon 0,3–0,6 g per day (10 receptions drug scheme) in the respective age dosage. 17 patients to improve the performance of the psychological status during the month was appointed Adaptol (mekibar) at a dose of 300 mg twice daily, providing neurotropic action on the causal mechanisms of psychosomatic disorders. ADAPTOL valuable qualities – as a means of correction psihosomatichsekih disorders lies in the combination system (regulatory) and cellular (membrane) mechanisms of action. ADAPTOL influence on neurotransmitter in the CNS processes based on the ability to normalize impaired imbalance between excitatory and inhibitory processes of the nervous system, is a leading pathogenetic link psychosomatic diseases. The drug activates processes of energy cells, glucose metabolism and tissue respiration. Nootropic effect ADAPTOL provided its properties and antihypocytic spsobnostyu improve cerebral blood flow, which in turn improves physical and mental performance, mental alertness, improves the emotional spectrum, memory and dynamics of cognitive processes.

Integrated use of the above drugs allowed to reach the positive dynamics of clinical symptoms of AD in varying degrees of severity. Benchmark analysis DDIKZH values indicate improved quality of life compared to the original ($12,4 \pm 2,3$ points), pruritus severity ranged from moderate to itch itching weak force (2–3 points).

The above demonstrates the need for examination of children with AD at AIT, and if it is available to add to the complex therapy antiviral agents. The results of therapeutic techniques prove the effectiveness of combined treatments of complex correction psychosomatic.

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Short Reports

**SOCIAL HEALTH COHORT STUDY
OF PEOPLE RECEIVING OUTPATIENT
PSYCHIATRIC CARE DUE TO INCAPACITY
DUE TO MENTAL DISORDER**

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The report analyzes the medical and social parameters and some clinical aspects of outpatient psychiatric care incompetent people due to mental disorder.

The increase in quantity of forensic-psychiatric examinations occurring in the last two decades for the purpose of recognizing incapacitated citizens determines a need for deeper studying of clinical and social characteristics of this category of citizens. Moreover there are questions of social and legal security and improvement of quality of medical help provided to persons incapacitated owing to a mental disorder [1, 2, 3, 4].

According to our data obtained when researching Log-books of persons having mental disorders and recognized by court incapacitated, from 1991 to 2010, and 580 medical records of outpatients deprived by court in accordance with the established procedure of capacity and receiving out-patient psychiatric help in «Volgograd regional clinical psychoneurological clinic», in the city of Volgograd, the number of incapacitated citizens increased by 8,5 times in the studied period. Steadily the number of incapacitated adults listed on the dispensary account grows in out-patient establishments of psychiatric services. In 2010 across Volgograd region there were 2096 people, in 2011–2414 people, and in 2012–2474 people.

Of persons recognized by court as incapacitated, men and women were in almost equal quantity. The age of patients ranged from 18 to 90 years (middle age – $56,1 \pm 19,6$). The main number of incapacitated persons (69%) on age constituted the most socially active part of the population from 18 to 55 years. At the point of research 53% of patients investigated had a mental disease of more than 20 years duration.

Most frequently intellectual backwardness was the reason for recognition of incapacity, the majority of this nosological group being young men of 18–25 years. Schizophrenia was the second most common reason for deprivation of citizens of capacity. Amongst this group of patients the most socially active age group of 25–55 years prevailed, and consisted of a higher proportion of women. The third group of patients had a di-

agnosis vascular dementia and belonged to age group 56 years or more. Higher prevalence of women among this group can be explained by the longer average life expectancy of women in comparison with men.

Disabled people were 65% of the interrogated persons within the first and second groups of mental disease, and 6,4% in the third group. Of these 27% were disabled due to a somatic disease. The greatest number of 45% of incapacitated citizens 25% – within 8–14 years had disability of 15 or more years duration. Disability of the majority of incapacitated citizens (42%) was issued in connection with the early beginning of a mental disease, and they never worked.

When studying negotiability of patients in a psychoneurological clinic, in a residence, it became clear that 37% of individuals incapacitated owing to a mental disorder attend the doctor without prompting (with the trustee), 30% – visit a clinic only when called to attend, 23% – do not attend a clinic, and 10% refuse clinic visits (see the doctor at home according to the frequency of the established dispensary supervision).

The majority of sick (57%) did not receive therapy, 22% received therapy incidentally and 1,75% received treatment only during hospitalization.

It became clear that 81% of incapacitated citizens live together with their trustees, in 16% of cases the incapacitated lives with other relatives (or persons who aren't relatives), and the trustee visits the patient. In 3% of cases the incapacitated citizen lives alone, and the trustee visits him.

The difference in age of the trustee compared to the patient, in most cases, was more than 10 years (29% of trustees were 10 years younger than the patient, and 38% were more senior). In 15% of cases the age difference was between 5 to 10 years, and only in 18% of cases the difference in age of the trustee and the patient was less than 5 years.

In 88% of cases trustees of the citizens deprived of capacity owing to a mental disease were relatives of the first line (parents, children, the spouse, brothers or sisters). In 9% of cases relatives were of the second line (nephews, aunts, uncles, cousins, grandmothers and grandfathers), and in 3% of cases were relatives of other degrees of relationship.

The high percentage of the trustees who are relatives of the first line can be explained by lack of any encouragement or personal benefit for the trustee. The closest relatives of the incapacitated citizen most often assume fulfillment of duties of guardianship, thus their care of the sick

relative is dictated by sincere intentions with no interest in personal gain. Within this contingent of trustees, any, even the most tactful invasion into their life from supervisory authorities is perceived extremely negatively. Obligatory reports in bodies of guardianship are perceived as personal humiliation.

Thus, today, it is obvious that the problem of medical and social rehabilitation of adults incapacitated owing to a mental disorder is highly relevant and demands further study, for the purpose of developing recommendations on improvement of quality of specialized psychiatric medical and social care provided, in order to increase social security of incapacitated and their trustees.

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THE PEAT CHARACTERISTICS OF THE ILAS MARSHES

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The Arkhangelsk Oblast takes the second place by quantity of peat deposits and the volume of peat resources in the Northern economic region of the Russian Federation. The Ilas Marshes are of high significance for Russia; it is a research polygon where multidisciplinary studies are carried out. This area can be considered as representative site for obtaining information about the patterns of formation of peat soils in the boreal zone. This article provides characteristics of top peat taking out of various deep layers of the Ilas Marshes. Component and element composition of peat was investigated. The structure of top peat resource potential was presented. It was shown that Ilas top peat is universal for extraction of various green materials, such as high-molecular humates and biologically active low-molecular substances (wax and resins).

Keywords: peat, marsh, component structure, element composition

The urgency of studying marshes ecosystems of the Northwest Russia is caused by high swamping of the area, as well as significant natural and ecological functions of wetlands. They are a source of raw materials and plant resources, as well as animal habitats, regulating

the flow of rivers and serving as a geochemical barrier for various kinds of pollutants [9].

In the Northern Economic Region, Arkhangelsk Oblast has the second highest number of peat deposits and the volume of peat resources, second only to the Vologda region (Table 1).

Table 1
 Comparative characteristics of peat resources of the Northern Economic Region [5]

Oblast (region)	Number of deposits	Peat deposits area of industrial depth, thousand hectares	Peat resources, million tons
Arkhangelsk	1917	1121,3	3750,6
Vologda	2376	1371,6	5573,4
Karelia	1299	706,1	2036,4
Komi	1077	900,8	2685,3
Murmansk	782	386,2	900,1

For the protection of peat bog ecosystems, in the allocation it is common to adhere to the following criteria determining the scientific value [5]:

- Natural landscape standards.
- The habitat of rare and endangered species of marsh flora and fauna.
- Research station experimental plots and marshes regime observation points.

Changes of the hydrometeorological regime have been monitored on the oligotrophic bog massifs of the North and the North-West European Russia since the mid-twentieth century [10]. For these observations, a number of bogs was selected, including The Ilas Marshes (64°17' N, 40°40' E), situated in the Primorsky district of Arkhangelsk Oblast, where the experimental plot of the Brusovitsa Swamp Station is located.

Oligotrophic boreal bogs are characterized by a convex surface shape, developed microrelief and complex nature of vegetation, with the dominant role of sphagnum. Microlandscapes of the marshes central part are usually presented with ridge-hollow complexes [10].

According to the Brusovitsa Swamp Station data [9, 15], the area of the Ilas Marshes is about 89 km². Microlandscape of the Ilas Marshes' central part is a system of oligotrophic ridge-hollow bog complexes (50–60% of which are occupied by ridges) with bog-hollow central portions (with numerous lakes up to 0,002 km² and 0,50–2,0 m depth). The vegetation is dominated by sphagnum: cotton grass-shrub with solitary pines (16,3%), shrub-cotton grass with rare oppressed pine trees

(12%) and pine-cotton grass (10,4%). Other microlandscapes (such as marsh, moss and forest) occupy smaller areas (2–3%).

Change of the bog water level is considered the most important in terms of im-

pact on plant associations [10]. The dynamics of these changes for the Ilas Marshes is shown in Fig. 1, where there is a clear trend of increasing depth of the bog water level in the studied period.

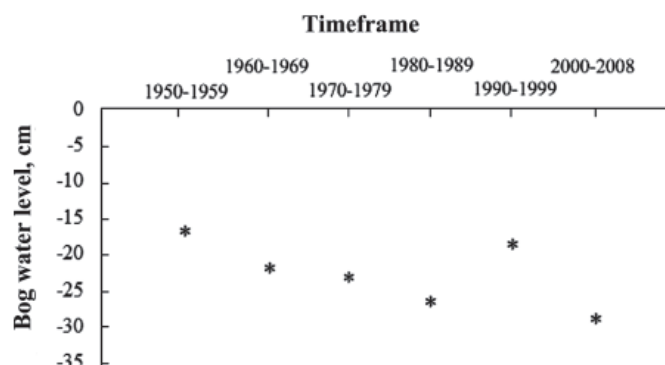


Fig. 1. Changing of the bog water level on The Ilas Marshes in the second half of the 20th – early 21st century [1]

Change in the bog water level is largely determined by the type of marsh landscape and climatic factors such as air temperature and the amount

of precipitation. Bog water level's dependence on the amount of rainfall for the Ilas Marshes estimated by Romaniuk K.D. [10] is shown in Fig. 2.

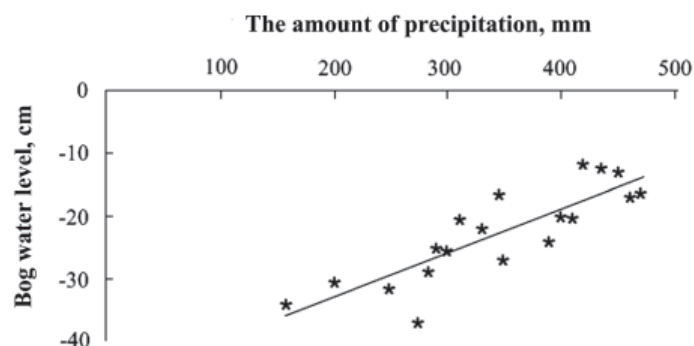


Fig. 2. Bog water level dependence on precipitation (The Ilas Marshes) [9]

Microlandscapes watercut and flowthrough determine the nature of developing vegetation. Items [2, 10] show that violation of bog microlandscape water regime within range exceeding the allowable ecological amplitude leads to a change in plant associations or change of their structure. Eventual drop of groundwater levels typical of the Ilas Marshes (Fig. 1) may lead to the creation of more favorable conditions for the growth and dominance of *Sphagnum fuscum* and *Sphagnum magellanicum* [2, 10]. And indeed, according to Churakova E. Yu. [14], the oligotrophic peat bogs of the de-

scribed territory are characterized by the following types of sphagnum moss: *Sphagnum magellanicum*, *Sphagnum fuscum* and *Sphagnum angustifolium*.

Thus, the Ilas Marshes are a scientific research polygon of the Russian value, where interdisciplinary study is conducted by bog researchers, hydrologists, biologists and ecologists. This area can be considered a representative site for obtaining information about the patterns of peat soils formation in the boreal zone.

The aim of this work is to study the component and elemental composition of peat

polymer matrices of the Ilas Marshes bog ecosystems.

Experimental part

Samples of the Ilas Marshes peat at Brusovitsa station were selected by drilling of low water during the summer 2009–2013 from five horizons of the central ridge-hollow swamp microlandscape at the depth of occurrence, respectively: 1 – from 0 to 5 cm, 2 – from 5 to 20 cm, 3 – from 25 to 75 cm, 4 – from 75 to 125 cm and 5 – from 165 to 215 cm.

It was previously established [13] that the moss turf consisting of living sphagnum moss has an average thickness of 6 cm, and its age is about 5 years. In the last 100 years, the average accumulation rate of peat overlying deeper in

the section defined in the isotope ^{210}Pb was 0,17 cm/year.

According to modern concepts [5], the structure of peat can be divided into three phases: solid, liquid and gaseous. Individual solid particles of peat are very diverse in their magnitude, ranging from a few centimeters (plant residues) to a few millimeters, and even smaller particles. It is known that, to a great extent, physical and chemical properties of peat depend on the composition of its individual phases and the quantitative ratios between them [11].

Group composition of organic substances was determined according to the scheme shown in Fig. 3 [11].

Fig. 4 graphically shows the dependence of content of various group components on the peat's depth.

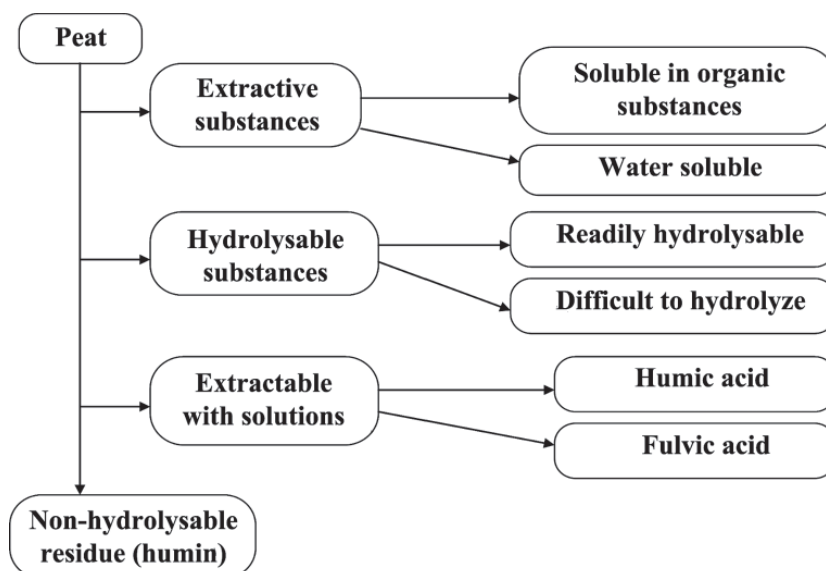


Fig. 3. Allocation scheme of peat organic matter

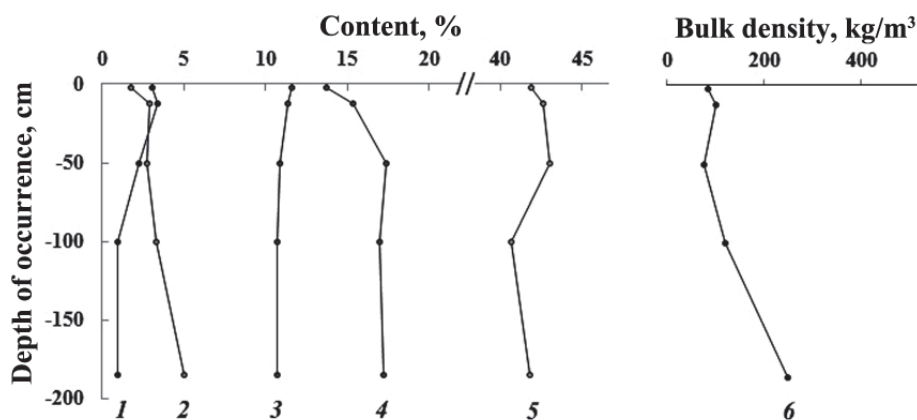


Fig. 4. Peat composition dependence on the depth of occurrence: 1 – ash content; 2 – bituminosity; 3 – humidity of air-dried sample; 4 – lignin content; 5 – humic and fulvic acid content; 6 – bulk density

The groundwater level fluctuations area is clearly distinguished at the depth of 50 cm. It is in this horizon that there is a decrease in ash content and water absorption, as well as increased levels of Klason lignin (compounds nonhydrolyzable by acids). However, this trend was not found when analyzing peat bituminosity; at the investigated depth, bitumen content increases smoothly by almost 2 times. Apparently, this is explained by the process of biological degradation of peat polymer matrix macromolecular constituents occurring with the formation of low molecular weight bitumen.

Component and elemental compositions are considered the important characteristics of

peat. For a more detailed consideration of peat organic matter component composition formed in the Subarctic climate conditions, the analysis of a sample from the depth of 0,5–0,7 m was performed; its peat polymer matrix has relatively stable physical and chemical properties. Results are presented in table (Table 3).

The data clearly shows that the analyzed peat has an average degree of bituminosity at relatively low ash content (Table 3). Apparently, this is affected by the low «gummosity» peculiar to plants of subarctic region compared to those growing in warmer climates.

Mass fraction of nonhydrolyzable residue (humins) is consistent with other researchers' data obtained for high peat (Table 2).

Table 2

Peat organic matter group composition

Indicator	Value *
The content of organic matter (OM), %	$\frac{97,4 - 97,9}{97,7}$
Including % of water-soluble substances	$\frac{1,9 - 2,3}{2,1}$
Incl. polyphenol substances	$\frac{1,2}{1,2}$
Bitumen extracted by hexane	$\frac{1,23 - 1,36}{1,3}$
Ethanol	$\frac{2,7 - 2,9}{2,8}$
Ethoxyethane	$\frac{3,35 - 3,45}{3,4}$
Ethyl acetate	$\frac{2,72 - 2,88}{2,8}$
Biopolymers of humus nature (in the form of humates)	$\frac{40,5 - 44,4}{42,5}$
Humic acids**	$\frac{2,1}{2,1}$
Lignin (Klason lignin)***	$\frac{17,1 - 17,7}{17,4}$
Humins ****	$\frac{51,4 - 54,6}{53,0}$

Notes:

* – the numerator contains a range of values; the denominator contains the average value;

** – fraction insoluble at pH = 1–2;

*** – figure determined in deasphalted sample;

**** – residue after extraction of bitumen and humic acids.

Peat bog ecosystems components are active participants of the carbon cycle as well as its significant reservoirs. Due to possible climate change, the study of carbon balance elements in wetland ecosystems is a particularly acute problem in terms of Euro-Arctic region, where wetlands occupy a vast area (up to 80%).

However, the studies on the carbon balance of forest and peat bog ecosystems in Russia are few. The elements of carbon balance are best explored in Western Siberia, which is called the waterlogging phenomenon due to the activity of its peat formation processes [3, 4, 7, 8 and 12].

Peat soils element composition of the Ilas Marshes showed that, compared with elemental composition of Siberian peat [6], peat soils of the North are depleted in nitrogen and carbon (C – 43,9%, O₂ – 46,4%, H – 5,9%, N – 0,3%, others – 3,5%).

Due to the fact that in ecosystems peat acts as geochemical barrier, it can concentrate a large number of elements – impurities [1]. Background state of peat microelements was

assessed by X-ray fluorescence spectroscopy (fundamental parameter method). Analysis of the mean concentrations of elements in peat samples of the Ilas Marshes shows that the iron content varies from 0,3 to 0,9%, sulfur from 0,3 to 0,6%, calcium from 0,5 to 0,6%, magnesium – 0,2%. The contents of substances relate to toxicant elements, such as strontium, zinc, copper, nickel and manganese ranges from 0,0009 to 0,05% (Table 3).

Table 3

Microelement content in peat samples of the Ilas Marshes

Name of Indicators	Element content in peat samples of the Ilas Marshes, %	Name of Indicators	Element content in peat samples of the Ilas Marshes, %
Titanium	$\frac{0,008 - 0,028}{0,020}$	Calcium	$\frac{0,53 - 0,58}{0,56}$
Strontium	$\frac{0,002 - 0,003}{0,0027}$	Potassium	$\frac{0,03 - 0,14}{0,097}$
Bromine	$\frac{0,003 - 0,005}{0,0037}$	Chlorine	$\frac{0,067 - 0,11}{0,087}$
Zinc	$\frac{0,002 - 0,05}{0,019}$	Sulfur	$\frac{0,43 - 0,60}{0,463}$
Copper	$\frac{0,006 - 0,01}{0,008}$	Phosphorus	$\frac{0,065 - 0,12}{0,061}$
Nickel	$\frac{0,004 - 0,01}{0,007}$	Silicon	$\frac{0,25 - 1,63}{0,96}$
Iron	$\frac{0,30 - 0,95}{0,557}$	Aluminum	$\frac{0,12 - 0,38}{0,25}$
Manganese	$\frac{0,001 - 0,017}{0,0073}$	Magnesium	$\frac{0,19 - 0,25}{0,22}$
Chrome	$\frac{0,02 - 0,02}{0,02}$	Sodium	$\frac{0,07 - 0,16}{0,10}$
Mercury [9]	$\frac{0,0000009 - 0,000006}{0,0000027}$	Titanium	$\frac{0,008 - 0,028}{0,020}$

In their paper, Ovsepyan A.E. and others [9] found that the mercury content in the Ilas Marshes soils varied within 0,009–0,06 µg/g, with an average of 0,027 µg/g (0,000027%). The highest concentrations of mercury are associated with soil horizon of 0,5 cm, relatively low ones – with the horizons 0,5–20 cm. The authors argue that the impact of the Arkhangelsk agglomeration and atmospheric transport of air masses on mercury contamination of soil samples is insignificant; mercury concentration in the soils under study is at the background level.

Diagram illustrating the resource potential structure of the Ilas Marshes peat is shown in Fig. 5.

Thus, the high peat of the Ilas Marshes is versatile both in terms of macromolecular humates green reagents extraction and biologically active low molecular substances (such as waxes, resins), as well as in terms of implementation of the calorific value of peat due to its low ash content.

The authors are grateful for the warm welcome and the assistance provided by the employees of Brusovitsa Swamp Station and its Head, Rastorguyeva N.V.; the employees of IEPN of the Ural Branch of RAS: Larionov N.S., Candidate of Chemical Sciences, Ulyanovskiy N.V., Junior Research Scientist, Khviyuzov S.S., Candidate of Chemical Sciences, and Kuznetsova I.A., Junior Research

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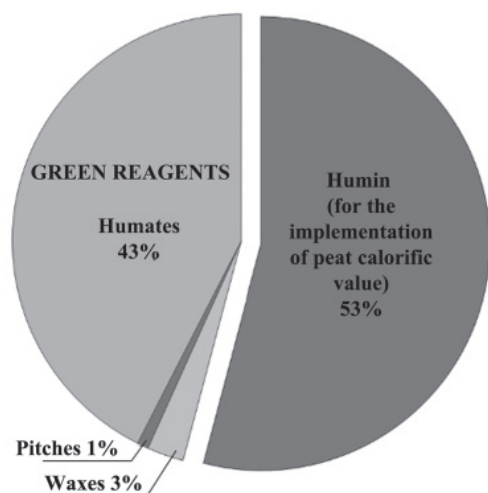


Fig. 5. Peat resource potential of The Ilas Marshes

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ETHNOGRAPHIC ASPECTS OF HISTORICAL TOPONYMY OF SOUTHERN KAZAKHSTAN

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The ethnographic aspects of regional toponymy considered in this article prove that application of the toponymic data can present a number of valuable data on the history of material and spiritual culture of the region.

Keywords: ethnographic aspects, toponymy, culture

It is known that the geographical factor refers to one of the major system qualities of an ethnic community. It includes the generality of territory, natural resources, economic and geographical position of an ethnos, productive territorial complexes and their components. The influence of the geographical factor is evident at different levels: as determining beginning of the genesis, formation and functioning of certain economic and cultural type of the Kazakh ethnos; as basic reason of the extreme readiness of the Kazakh national geographical terminology, quantitative and qualitative structure of the Kazakh toponyms. The regional ethnocultural (ethnographic) toponymic lexicon comprises a set of the data revealing cultural, historical and other features of a certain region. The new direction of toponymic researches which can be called ethnographic toponymics, has things in common with ethnography, history, geography, country-studying and other disciplines, and, applying the data, the ethnographic toponymics promotes the solution of some problematic questions of the mentioned above sciences.

It is possible to state that the most striking impression on onymic lexicon of the Kazakh language had the ancient historically set traditional national type of Kazakh management – the nomadic cattle-breeding. The detailed differentiation of kinds of pastures and relief elements in the geographical lexicon is interpreted by mediated influence of nomadic cattle-breeding: presence in toponymy of considerable percent of names of various kinds of vegetation used for cattle forage; presence in toponymy of a considerable number of colour, size, form designations that characterizes the heightened role of visual perception of the world around by the nomads, etc.

The leading form of economic activities in concrete geographical conditions substantially determined the major ethnographic parameters of a life mode. In turn the various aspects of material and spiritual culture of the ethnos became the reason for occurrence and functioning of the ethnodetermined and ethnomarked nominal and onomastic lexicon.

The names of hibernation («kystau»), pastures («zhaiylym», «zhailau», «kuzeu», «kokteu»), nomadic roads («kosh zholy»), places

of ore and mountain workings («ken», «ken orny»), artificial water sources («aryk», «kudyk»), many settlements, mountains and natural landmarks with sacral semiotics, etc. can be referred to the ethnodetermined part of historical toponymy of Southern Kazakhstan.

Such forms of management and phenomena of spiritual culture as nomadic, seminomadic and settled cattle-breeding, agriculture, irrigation, mining and metallurgy, town-planning, various beliefs and cults, religions; different spheres of national life: hunting, festivals, games, customs, etc. played the role of a distinctive determinant in occurrence and functioning of this part of ethnographic toponymy of Southern Kazakhstan.

Tasks setting

Such lexical elements (ethnolexemes, etnografizms, ethnomarkers, professionalisms) as «kystau» («kystak»), «kuzeu», «kokteu», «oris», «kozykesh», «tebin» («aktebin», «alatebin»), «zhailau» («kan zhailau», «sary zhailau», «oi zhailau», «etek zhailau», «bokter zhailau», «tor zhailau», «ker zhailau»), «bedelik», «otar», «shabyn» («shabyndy», «shabyndyk»), «ashy», «orten», «orda», «arba», «balyk», «korgan», «asar», «tam», «kamal», «oba», «mazar» («mazarat»), «mola», «zirat», «beyit», «tortkul», «kora», «aran», «kon», «kotan», «koryk», «kent», «auyl», «abat», «rabat», «kepe», «sumbe», «kesene», «tura», «baba» («bab»), «aulie», «bayge», «toy», «as», «topalan», «may», «sas», «aydar», «zhylan», «burkit», «kerege», «kebezhe», «sandyk», «dorba», «kalta», «korzhyn», «ketpen», «pispek», «kudyk», «aryk», «togan», «keriz», «nayza», «kylsh», etc. form the ethnomarked toponyms of Southern Kazakhstan.

Toponyms containing ethnims and genonyms can also be referred to the same group of toponyms. Division of ethnographic toponyms on ethnodetermined and ethnomarked is conditional in certain degree, as all the ethnomarked toponyms are inherently ethnodetermined.

In the article the ethnomarked toponyms of Southern Kazakhstan are generally considered and analyzed as numerically infinite. That is why the ethnodetermined toponymic material of the region demands special research.

It is well known that the efficiency of pastures and their use during warm time (in summer, partly in spring and autumn) were defined not only by their fodder resources, but also by providing with natural water sources which level quite often was very limited. That is why the nomads constructed artificial reservoirs – wells, diggings, dams, etc. In Southern Kazakhstan along with the areas rich with natural water sources representing ancient agricultural oases, the big area is occupied by deserted and semidesertic zones where the necessity for wells is quite obvious. Thus in historical toponymy of Otrar, Algabas, Suzak, Shardara areas a considerable role play the names of wells: «Babakudyk», «Ashirkudyk», «Bai-bishe kudyk», «Baimen kudyk», «Beskepe kudyk», «Beskudyk», «Bestamdy kudyk», «Buzhyrkudyk», «Birshakty kudyk», «Aiten kudyk», «Auganbai kudyk», «Akbiy kudyk», «Akkudyk», «Akmalai kudyk», «Akmamet kudyk», «Dala kudyk», «Zheti kudyk», «Egizbai kudyk», «Eltai kudyk», «Kairak kudyk», «Karakudyk», «Karauly tobe kudyk», «Katty kudyk», «Kalta kudyk», «Kakkudyk», «Karauly kudyk», «Kuspek kudyk», «Kopen kudyk», «Koskudyk», «Kasymbek kudyk», «Kysh kudyk», «Kosaryk kudyk», «Shatyrykudyk», «Sorkudyk», «Syrkudyk», «Kersen kudyk», «Ketpenkaldy kudyk», «Korzhyndy kudyk», «Kakpakty kudyk», etc.

Rather productive in carrying out an analysis of semantic content of a «wells» toponymy can be a semantic model: «Anthroponym + term («kudyk»». In the pre-revolutionary nomadic cattle-breeding economy the communal property was applied to all artificial water sources. Though the process of digging of wells was carried out by one master or 2–3 masters for digging a deep well («shanyrau»), fund-raising for payment of diggers' labour, annual and seasonal restoration of wells, and, of course, their use were carried out by a community (auyl). Creation of wells was financed not only by community, but also sometimes by one person («bai»), and then such wells were named in honour of the owner (bai).

Some wells got the names of their makers, i.e. famous masters – well-diggers.

Other models of names of wells can indicate their various kinds and distinctive features. Thus the name «Kos kudyk» (a twofold well) means that the wells were situated side by side, and containers for water, operating by a horse (a camel, an ox), were alternately lowered into the wells that provided a rational watering place for a significant amount of cattle.

To ethnomarked part of ethnographic toponymy of Southern Kazakhstan can be referred toponyms with such ethnomarkers as «kora», «kotan», «aran», «kepe», «kon» that designate

premises for cattle: «Polatkora», «Taskora», «Arandy», «Kotandy», «Beskespe», «Kepe-saray», etc. Nearby the «kystau» the nomads organized specially fenced off and protected shelters «kora» made of stone, tree, cane, turf, brushwood, old condensed manure. If for severe winter conditions of Northern Kazakhstan were made special covered housings almost for all four kinds of livestock (sheep, cows, camels, emaciated and weaken horses), whereas in steppe and deserted areas of Southern Kazakhstan housings only for a horned cattle and sheep were constructed. And, for cows, which winter pastures were usually riverside zones of rivers and lakes, were made covered housings, for sheep, which spent winter in the areas of deserts and semi-deserts open housings were constructed.

In mountain and foothill areas of Southern Kazakhstan were constructed artificial or used natural stone shelters for keeping the cattle. Thus nearby the Beszhal mountain (Tulkibas area of Southern Kazakhstan) there was a stone housing («taskora», «polatkora») for construction of which the natural shelter was used (informant Kerimbay-uly Auyelbek, 1973). In sands of Moinkum and Kyzylkum open «kora» made of saxaul, cane mat («shiya»), snow were constructed; near the rivers and lakes in cane tangles the housings made of cane were constructed or a round shelter for cattle known as «kotan» was sloped. In Southern Kazakhstan for keeping young cattle dug-outs or primitive hovels («zherkepe», «zher yishik») were used.

The ethnomarked toponymic material combined in one lexical set with general meaning «housing for keeping the cattle», indicates various features of winter cattle keeping (winter pasturing), caused by regional natural and environmental conditions.

It is possible to conclude that the ethnomarked toponyms which are territorially bound (local), can convey important information concerning the forms and features of economic management in a certain region or concrete territory. These data can be relevant for determining one of the set of gradation of nomadic and settled types of economy and life mode of the nation, its local ethnographic groups.

On existence of irrigation agriculture on the territory of Southern Kazakhstan since ancient times indicate numerous ethnomarked toponyms with such ethnomarkers as «aryk», «togan», «toma», «boget», «keriz», «egin», «egindi», «bidai», «tary», «arpa», «konak», «kauyn», «shui», «aty», «shyrym», etc. Medieval written sources have many examples of names of irrigation ditches (aryks). So, in Sygnak, as Ruzbikhan informed, the fields were irrigated by Seykhun aryks listed in Sygnak charters: «Kyzyltal», «Chikhil» – «Tugay»,

«Ordakent», «Kalta» – «Dzhalgiya», «Dzhulak», «Ming-Bulak», «Arslandy», and also water sources of «Toktamys», «Harash», «Hisarchuk».

For determination and localization of regional zones of irrigated agriculture mapping of «aryk» toponyms would be rather effective. A continuous frontal investigation and recording of all without exception toponyms (micro-toponyms) of the region, and also identification and localization of historical «aryk» toponyms, mentioned in ancient, medieval and later written sources are necessary for this purpose.

Results

A considerable historical, ethnographic and also toponymic material concerning agriculture and agroirrigation in Southern Kazakhstan is contained in a well-known book by N. Dingelshtedt «Experience of studying irrigation of Turkestan territory: Syr-Dariya area» (Vol. I–II, SPb., 1893–1895), in editions of Migratory department in 1906–1908 (the Materials on the Kirghiz land tenure of Syr-Dariya area. Chimkent district, Vol. I, Tashkent, 1908; Vol. II, issue 1–2, Tashkent, 1910; the Materials on the Kirghiz land tenure of the area of the river Chu and lower reach of the river Talas of Chernyaev and Auliye-ata districts of Syr-Dariya area. Tashkent, 1915; Economic life of the Kirghiz, Sarty and Russian population of the southeastern part of Chimkent district of Syr-Dariya area, Vol. I, Tashkent, 1910).

These works are of a great value for studying the ethnographic toponymics of Southern Kazakhstan.

The indications on some features of irrigating (irrigational) systems and forms of their usage can be contained in names of irrigation ditches (aryks), canals, natural boundaries, arable lands, settlements: Bozaryk, Belaryk, Akaryk, Terekti toghan, Zhiynbay aryk, Zhunigun aryk, Birlik, Rabat, Kumkol, Ogiz zhylgha, Balyk, Salaryk, Koghamaryk, etc.

Thus, for example, toponyms with the notion «toma» contain indications concerning the fact that in this district for the use of deep springs special artificial pools were constructed. For this reason a ravine where a spring flowed into was dammed. During the night it was filled with water, and in the afternoon the dam was broken through in that place, from which there was an irrigation ditch (aryk) to the fields. Such «toma» were used in the system of irrigation agriculture in former Kazghurt and Maylikent volosts, and in the latter (currently Tyulkubas area) sometimes through a dam there were put special clay pipes that were inserted at a level of the bottom of a spillway and supplied water to irrigation ditches (aryks).

A careful linguistic (etymological) analysis of names of irrigation ditches (aryks) on the ba-

sis of historical and ethnographic data will help to investigate some features of a traditional system of irrigation of arable lands of the region as, despite an apparent abundance of the researches, many questions were clarified not enough.

Thus in the former Semirechensk area «... except head barrows) and minor there are third-rate irrigation ditches (aryks)». In our materials the names «Basaryk», «Belaryk» indicate that in this area the main (head) irrigation ditches (aryks) were used.

The toponyms with an ethnomarker «kyariz» are isolated and generally they can be found in the territory of Turkestan area. Existence of kyariz system of irrigation in this region in the past is proved to be true by archaeological researches. Thus in the suburbs of Sauran in the XVI century there were kyarizs the remainders of which were found by famous Kazakh archeologist K.M. Baypakov. N. Dingelshtadt wrote that in the northwestern part of Turkestan area there were large enough constructions total to 250 wells and united by adits.

The ethnomarked toponyms of Southern Kazakhstan with terms «baba» (bab) undoubtedly have sacral semiotics: the hillock Artykata, the ridge Surenata (on the border with Tashkent area), the tomb Seksenata-aulie, the lake Koylanata, Kozdyata, the river Koshkarata, the stream Zhunisata, the cemetery Arystanbab, etc. More concrete and detailed their consideration with application of etymological, ethnographic data can give a number of valuable scientific data concerning cults, beliefs, ceremonies and customs of the Kazakh ethnoses.

A considerable historical and ethnographic interest is represented by numerous enough historical names of ancient, medieval and some modern cities and settlements of Southern Kazakhstan which contain such ethnomarked lexical elements as: «tura», «balyk», «orda», «arba», «kent», «shakhar», «kala», «kat», «ket», «korghhan», «khisar», «sumbe», «saray», «tortkul», «tam», «abad», «rabat», «yasar», «band», «bend», etc.

Some of these terms entered the nominal and onomastic lexicon of many world languages and have the most surprising transcontinental areas.

Conclusion

The historical and linguistic analysis of place-naming in Southern Kazakhstan demonstrates an interesting picture of interaction and interference of nomadic and settled ethnoses within one region. According to B.V. Andrianov and T.L. Zhdanko on vast spaces of Central Asia and Kazakhstan the nature itself was favourable to historical interaction between settled farmers and nomads-cattlemen: fertile foothills and wide valleys of the rivers were the base of ancient agricultural culture;

deserts and steppes served pasturable cattle breeding; massive mountain ranges with vertical change of landscapes were used by both cattlemen and farmers. The academician A.Kh. Margulan who investigated the history of cities and building art of ancient Kazakhstan, wrote that the basins of the modern rivers Chu, Talas and Syr-Darya were the centers of vigorous city culture. Vivid examples of the linguistic (toponymic) data application for disclosing and analysis of the history of cities of ancient and medieval Kazakhstan are presented by A.Kh. Margulan. Thus, for example, he wrote: «The cases of organizing sites and settlements according to vehicles formation can be met quite often in the history of Kazakhstan, and especially it is characteristic for the Middle Ages. The settlements which got their names according to vehicles formation, existed in the ancient times on Syr-Darya river (Kangka), in the Middle Ages on the river Ural (Kyryk arba), in the lower reaches of the river Nura («Toghanastyn toksan eki kuymesı»), near Ulutau («Orda-Khonghan») and in Ubagan. The Kazakh place names connected with the word «orda» («horde») are more typical for such sites and settlements».

Even preliminary consideration of the ethnomarked «city toponymy» – historical place-naming of Southern Kazakhstan indicates difficult historical and ethnographic, ethnogenetic, ethnocultural contacts of various ethnoses within vast historical and ethnographic

area that the Central Asia and Kazakhstan are for the adjacent regions: Asian Near East, Transcaucasia and Northern Caucasus, Transurals, Southern Siberia, Central Asia.

The ethnographic aspects of regional toponymy considered in this article prove that application of the toponymic data can present a number of valuable data on the history of material and spiritual culture of the region.

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*Materials of Conferences***INNOVATIVE DIRECTIONS
IN INVESTIGATION AND TEACHING
OF CULTURAL HERITAGE OF GANJA**

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The city's location on the ancient silk roads was the reason of developing spiritual to East tradition, and reflected national customs and traditions carpet weaving, knitting, sewing and other sectors of light industry and urban, and group of textile and weaving carpet enterprises, also the activity of sewing factory and other industrial enterprises have provided. In the Middle Ages there were the perfect transportation system here. If in Europe underground transport was built in the middle of the twentieth century, in Ganja in the Middle Ages were two-storey underground roads system, where also phaeton could be used. In addition to the transport and movement of population there were also other communication systems [1–3].

Among the Middle East's transports, Ganja's transport infrastructure plays a most important role. The city's airport of international standards, is realize air flights to many countries of the world. Vast scale Baku-Supsa, Baku-Tbilisi-Ceyhan oil pipeline, Baku-Tbilisi-Erzurum gas pipeline also are transported via the Ganja. Communication is one of the leading services of Ganja, that plays an important role in the socio-economic life of the city. The first Post Office in Azerbaijan was opened in Ganja. Mail expedition was established in Nakhchivan in 1828, and in Baku in 1836. The first Minister of Post and Telegraph of the first democratic republic in the East ADR was Ganjali Aga Ashurov. This ministry was located in the ancient building of Ganja's post-office in present days.

The quick development of information and communication technologies in Ganja plays an important role in strengthening of statehood, the development of the economy, the regulation of social and political processes widen relations and enlightening the people. At present, mobile phone, Tran's registered mail, internet service and also other areas of technology informations are the foundation of communication service in Ganja. Ganja is one of the cities of Azerbaijan that has ancient history, rich culture, and unique tourism opportunities. Ganja's favorable natural and geographical position, pleasant climate, unique world of flora and fauna has always attracted tourists. Hajikend settlement, Koshku, Ashigli, Ezgilli, Chay kend and Togana kend were places of recreation of Ganjabasar. Also, Khoshbulag village is one of the most picturesque places of recreation of Ganjabasar. Approximately there are about 4800 residents and 1000 houses in the village. Meadow grasslands are green from early april

till the middle of october. In some areas have been grown the artificial pine forests. From ancient times in watter supply of Ganja, that has a perfect communication system, underground-pipes pulled from Ganja and Qushqara river have played an important role. It is not accidental, that travellers, that come to Ganja, can't conceal their admirations, when they see Ganja's greenness cover, climate and rich water.

The city has always protected its exception in the world with valuable (mostly) grapes gardens, plane alleys. Therefore, Ganja's rose is famous not only in Azerbaijan, but also outside.

In general, climate and water supply system of Ganja have formed here the most favorable environment for the construction of parks and alleys, that are beautiful greenery and recreation centers. Recreation and culture park, named Heydar Aliyev, that differ with its immense and greatness, and also Khan Bagi (Khan's garden), that belongs to the ancient Turkic tribes to the kajars, are the most valuable evidence of our conceptions. Khan Bagi, that has a very beautiful view, for the richness of the plants is considered as a rare natural place. Parks and avenues, which is named Fuzuli, Nariman Narimanov, Fikret Amirov, park «Qelebe» (the «Victory») and others give such as special beauty to the city, and also turned the city to the favorite recreation place for the population of Ganja and for its guests.

After the capital Baku, Ganja is the second largest center of science and culture of Azerbaijan. Because of region, where located the city in the South Caucasus has very important strategic position, in the I–IV millennium the main caravan route, that connected trade centers of the Middle East and Front Asia, were here. The ancient city Ganja found development on this trade way and over thousands of years was one of the well-known cultural centers. Today, according to the history tradition, after the capital of Azerbaijan – Baku, Ganja is the second largest center of science and culture. Theater, music, museums and libraries, that reflecting the cultural level of the city, contributes development of the intellectual sphere.

Well-known thinker, a patriot Ganja intelligent, an active member of the Party «Difai» and the society Mirza Muhammad Akhundov was founder of theater culture and wrote work «What is the Teatro?» about theater's role in society. The first great national theater in Ganja was in 1933, on the basis of «Tengid-teblig theater» («critical-promoting theater») in Baku, that was founded in 1933. An ancient cultural center of Azerbaijan Ganja is rightly proud of well-known persons and valuable contribution, that it has given to treasury of the world's musical culture.

An ancient Ganja and Ganjabasar is the land of Ozan's, the cradle and hot spring Ashuq's art. It becomes clear from the information in the book

«Kitabi Dede Korkut» (VII century), that ozan's history in our territory is very ancient. Ozans, who had taken «Qolcha Gobuz» (an old Azerbaijani musical instrument) and shared from country to country, from man to man people's happiness and sadness, were the leaders of people's parties. The most ancient stringed musical instrument gobuz is a predecessor of the modern ashuq's saz. Dede Korkud's expression «gobuz is sacred» shows respect of our nation to music.

In the Middle Ages in Ganja poets, musicians, wise men and artists had meetings and were talking about science, literature, music, art. An existence of such kind of meetings prove participation of the first well-known poetess of Azerbaijan, the first woman chess player and the first prominent female musician Mehseti Ganjavi (XII century) and other scientific and literary sources [2–5].

Creation heritage of the great poet and thinker of Azerbaijan Nizami Ganjavi (1141–1209) on the universal importance gave a rich information to the national culture, and also influenced to the development of literature and art. Nizami's characters have become the symbols of the culture of Azerbaijan. Many composers created vocal works, operas and ballets, symphony and other eternal music, that praised Nizami's poetry in music, and enriched world's culture. In XI–XII centuries there were creative meetings in Ganja, where singer, musician and poets took part. In such meetings the representatives of literature and art of that period, including Mahsati Ganjavi, also took part. Great Nizami Ganjavi in his works has said the name of thirty popular musical instruments that were widely spread in Azerbaijan at that time. This fact also proves that in XII century and more that earlier Azerbaijan people had high musical culture. Ganja city, that has high music feeling and the music culture, gave to the history of Azerbaijan national music such well-known composers as Meshedi Jamil Amirov, Fikret Amirov, Ganbar Huseynli, Zerif Gayibov, Telman Aliyev and Alakbar Tagiyev.

The love tradition to music lives in Ganja till nowadays. At present, State Philharmonic Society, «Goy-gol» State Song and Dance Ensemble, Orchestra of Folk Instruments, Ganja State Chamber Orchestra, music colleges, music schools are functioning in Ganja. All genres of music – ashug, folk songs, opera, also the types of modern music have developed a high level in Ganja. More than 60 different medical institutions serve for the health of townsmen of Ganja. Currently, 20 hospitals, the Central Clinical Hospital, Eye diseases hospital, infectious diseases, Endocrinology, Psychiatry, 2 Children's Hospital, First Medical Aid, Railway hospitals, 13 Ambulatory polyclinics, 5 Dispenser,

3 Medical Sanitary Section; 9 Medical Center: Diagnosis, Ganja pensioners Territory Social Service, Ganja Railway Hygiene and Epidemiology, Reproductive Health and Family Planning, Esculap Medical Center, Orthopedic Prosthetic Center, Beauty and Health Center, 2 Consulting also the First Aid Station, Children's tuberculosis sanatorium and Maternity hospital are working here. In whole, there are 1387 doctors and 2622 nurseries work in medical centers of the city. The modern medical facilities, located in the city, are equipped with high-quality medical equipments [6–12].

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LANGUAGE POLICY AND THE KAZAKH ALPHABET

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Studied the Soviet language policy. Emphasis is placed on its continuity with the policies of Tsarist Russia, differentiated its political influence in the formation of the Kazakh alphabet and writing. In the early twentieth century Kazakh letter to get rid of the influence of Arabic, Persian and Russian languages reformed Arabic alphabet developed variants of the national alphabet. The most systematic of them – Option A. Baitursynuly. It was used in the community until 1929. Since 1929, the Kazakh script was translated into Latin script. The new alphabet was based on charts A. Baytursynuly, which includes 28 specific sounds. In 1938, under the pretext of non-compliance of international writing the words on the Kazakh Latin, a sound system of the Kazakh language were included foreign to her letters represent sounds *x, φ, e*. Have been enacted new orthographic pravila. V 1940 Latin alphabet replaced the Cyrillic letters were taken due to the Russian fonetiki. V than a few times to make additions to the spelling rules. At present, the Kazakh alphabet goes from Cyrillic to Latin. In this connection there was a controversial question: to create original alphabet consisting of 28 letters or include in the foreign-language alphabet letter sounds. Kazakh lingvisty rassmatrivyut this issue closely related to spelling.

Keywords: graphics, Latin, spelling, vocabulary about the spelling of foreign

In the apt definition Akhmet Baitursynuly, «language – a powerful force both for and degeneration of the nation. The people who did not keep his word, and he disappears» [1]. The development of any language as a living organism, its improvement is closely linked to the number of its speakers, who consider this as their native language, it is widely used in various fields of communication. A number of speakers depends, first, on the quantitative and qualitative composition of the nations, and secondly, on the language policy of the state where the given ethnic group lives. The latter provision clearly reflected in Russia's policy towards other nations.

From the middle of the nineteenth century in the Russian Empire intensified policy of Russification of representatives of other nationalities. Education and training has been associated with the promotion of orthodoxy. In this direction succeeded such renowned educators as N.I. Ilminsky, A.E. Alektorov, A.V. Vasiliev. Particularly important is the role N.I. Ilminsky [2]. They are attracted to children of indigenous nationalities in the Russian school. Graduates of these schools are great personalities: D. Banzarov, Sh. Ualihanov, Y. Altynsarin. Everywhere open Russian-otherwise school textbooks are published, even created the national alphabets based on Cyrillic letters. Thus, according to K. Kuderina, the first Kazakh alphabet, based on the Russian alphabet, created by N.I. Ilminsky [3]. N.I. Ilminsky designated the specific sounds of the Kazakh language graphically Titley. Remarkably, he did not include the Kazakh Russian alphabet letters *e, e, u, φ, u, x, y, u, b, e, e, y, a* [3]. But this alphabet was not accepted by the local population. Then an attempt was made by the hands of the introduction of the alphabet natives. In fact, it embodies Y. Altynsarin – he created the first Kazakh Cyrillic alphabet, wrote a textbook on it [4], established the first Russian-Kazakh

school. So held the language policy of the Russian empire in relation to the alphabet.

In opposition to such a policy at the beginning of the twentieth century created «dzhaditsky» (new) current of Russian Muslims led by I. Gasprinsky. They are reforming used by the Arabic alphabet, complementing its graphical notation of sounds of a national language. The old methods of learning are replaced by new ones. Among the Kazakhs this technique is called the letter «*төре жазы (tote zhazu)*» (literally «direct, quick email»). In the years 1907–1914 were published 7–8 variants of the first Kazakh alphabet [5]. Besides these, there were hand-written alphabet books. For example, the manuscript of the alphabet, written by Mullah Kokpay. At the moment, it is stored in the collections of the National Library. But the most systematic, sustained graphically recognized A. Baytursynuly option [6]. The magazine «Aikap» (1911–1914) for the purpose of valuation of the Kazakh graphics publishes articles on options alphabets, creates a serious wide-ranging discussion on the subject. In solving the problem of actively participating A. Baytursynov detail justify its graphics system. His alphabet from 1912 is widely distributed in the country and is in use by the end of the 20s. According to the alphabet still enjoy the Kazakhs of China. It is a clear expression of opposition to the policy of Russification of education.

Those who came to power in 1917, the Soviets also impartially continued policy of Russification. In the first decade of Soviet power to create certain conditions for the development of national languages. So, after the revolution, during the formation of the Soviet government formed by the People's Commissariat of the nation, headed by Stalin. «Declaration of the Rights of Peoples of Russia» on 15 November 1917 proclaims the mutual equality of the nation, in the decree № 2 All-Russian Central Executive Committee (ARCEC) and the Council

of People's Commissars (CPC) on February 15, 1918 decided that in all instances of judicial proceedings will be used by all the local languages [7].

Of particular importance to the development of local national languages attached IV Stalin. He wrote: «There is no mandatory» state «language – either in the proceedings or in the school». Each region will select the language or languages that correspond to the composition of its population, and will be complete equality of minority languages as well as in all public and political institutions [8, 70].

People's Commissariat of Russia (Commissariat) passed a resolution «On the school of small nations» from November 31, 1918. In 1919, at the VIII Congress of the RCP (b) refers to the need for a unified labor school with the national language of instruction. As a result, in 1921 in Turkestan (Central Asia) begin teaching in national languages, including and the Kazakh [9, 31]. In March of this year, the Kazakh Central Executive Committee (CRC) decide that all its members should as soon as possible to learn the Kazakh language [10, 28].

In 1922 he created the Central Eastern Publishing, the publisher of literature in the languages of the peoples of Central Asia, based on the national charts. For the purpose of mastering the Marxist-Leninist ideology of every people in their native language, Russian and indeed the whole world artistic and political literature translated into local languages.

All of these primary policies have served to strengthen the image power among the peoples of the USSR. By the end of the 20th years of the last century, the political course changes drastically – starts Romanization (translation of the Latin script), the languages of the Union Republics. As the V.V. Bazarova, in carrying out this policy, an important role was played by the authority of the Company's new alphabet and the Academy of Sciences of the USSR and the special support of the state [11, 58]. The author also notes the direct participation of Stalin: «Attention is drawn to the fact that Stalin did not leave large documents that would touch his direct involvement in the reform of writing. However, the large amount of material that was more fully represented in the debate on linguistics in the post-war years, suggests that these issues are actively engaged in it» [11, 58].

Not informed about the background of the language policy – switching to Russian and orthography – Soviet Turks were preparing for latinization

In 1928, at a meeting in Baku were presented and studied projects alphabets-Latin script for each of the Soviet Turkic republics. Kazakh project schedules, consisting of 28 letters, was presented to a group led by O. Zhandosov. The

project is hotly discussed in 1929 at a conference in Kyzyl-Orda T. Shonanuly, E. Omarov, K. Kemengerov, K. Zhubanov, E.D. Polivanov etc. Then he (the project), improving, became include 29 letters [12]. This option is based on the Arabic alphabet A. Baytursynuly, 20 years selflessly served for Kazakh society [13]. Alphabet A. Baytursynuly once created taking into account phonemathic Kazakh language and has been recognized not only as fellow scientists, but also with foreign counterparts. So, E.D. Polivanov particularly noted: «This last form, which took a Cossack-Kyrgyz schedule in 1924, I was in any case, I think not needing as amended and represents the latest step in the historical formation of national schedules, which can be fully Kyrgyz officials proud of Education – creators of the reform as a major cultural conquest» [14, 32].

As a result of this policy, all the nations of the Soviets, except Russian, Georgians, Armenians went to Latin.

In 1929, in connection with the transition to the Latin alphabet in Kazakhstan was held spelling reform. Recognized the fundamental position expressed in the textbook A. Baytursynuly «Тіл – құрал (Language – means)» [13] as well as the views expressed in the First All-Russian Congress of Turkic studies in Baku. At the Congress, in its report on the nomenclature system, noted the discrepancy A. Baytursynuly nature of the Kazakh language pronunciation of the words of European origin: «That's why we're going to take foreign words in such a way that it was easy for the pronunciation of the Cossacks. Similarly, other Turkic peoples should not be considered as the origin of words, and should be considered a dialect, the articulation of the population» [15, 277]. So he insisted on writing borrowed words according to the spelling of the local language.

About the spelling of foreign vocabulary H. Dosmuhameduly in 1924 said the following: «The peoples of Europe using the Latin words as terms do not leave them in their original form, and are tailored to articulating the basis of their language. The word is subject to change in accordance with the laws of their native language» [16, 95]. One of the supporters of this trend E. Omaruly in the same year in Orenburg to the First Congress of the Kazakh intelligentsia suggested: «If the word that expresses the concept of a particular branch of knowledge, is not in their native language, you can use their Latin equivalents. But the alien vocabulary should be subject to the ranks of the native language» [17, 97]. Most of the Kazakh intelligentsia at that time supported this point of view, moreover, still no pressure to write borrowed through the Russian language words in Kazakh – due to these factors in 1929

in Kyzyl-Orda officially fixed spelling rules, on which is written in a foreign language vocabulary according to the phonemic system of the Kazakh language. As exemplified by the work of a researcher Latin spelling by N. Amirzhanova, written in that year [18, 190–195].

The idea Turkic-speaking peoples of the Soviet Union through the transition to the Latin alphabet to create a common script, set the close ties among themselves and unite the Turkic world, to form a unified literary language remained relevant in the first decade of Soviet power. However, as Western scholars, the implementation of these tasks was initially impossible. The Turks at that time were well aware of each other, despite the specificity of each language, yet the difference in economic and cultural development would be unable to contribute to their convergence [19, 8]. As was confirmed in further Soviet language policy.

Before 1938, the loan words were written in Latin, «Kazakh»: «сатсыйализм», «сатсыйалист», «кәмүніс», «балшабек», «репорма», «сәбет», «пебырал», «сабнарком», «пұртакол» and etc. Since 1938, according to the amendments to the Regulations of 10 paragraph reads: «the words that have become distorted due to the lack of them in our vocabulary, and will now be spelled correctly, denoted by the letter consonant sounds **х, ф, в**». For example, the norms are *хат, хан, химия, фазыл, вагон, совет*. Not allowed to write «*Қат, қан, қыймыйа, пазыл, вәгөн, сәбет*» [18, 97].

When, in 1940 under the influence of national political forces in the zone of the USSR passed Cyrillic S. Amanzholov was compiled and reigning alphabet, complete with Russian letters, previously unavailable in the Kazakh language. That, in turn, contributed to the introduction to the language rules that are alien to the laws of its development. Distorted, it's incredibly complicated spelling. For this reason, several processed spelling dictionaries (1940, 1957, 1978, 1983) [20, 7]. The last option – «Spelling Dictionary», approved by the State Committee of the Republic of Kazakhstan terminology and adopted in 2006 [21].

During this period, many scientific works of famous Kazakh linguists, praising our «hybrid» mixed alphabet and spelling. They talked about the favorable impact of the Russian language on the modern possibilities of the native language, able to pronounce and write any foreign word [22, 23, 199–205, 24, 48, 25, 22, etc.]. Imbedded common rules in unrelated languages led to numerous footnotes (exceptions) in the language of law. Deal with this problem have dedicated their work N. Ualiev and A. Aldasheva [26].

The protection of the nature of language arose many scholars. Thus, long-term scientific

creativity S. Myrzabekova updated the need to preserve the vowel harmony of the Kazakh language [27]. A. Zhunisbekov first openly wrote about the negative phonetic processes in the native language [28, 24]. In one of his works, he says, «sounds are not related and are not identical with the Kazakh language Russian language, first of all, have dramatically increased the number of sounds in the first. Secondly, it was a lot of words that do not obey the law of vowel harmony. Third, become complicated spelling. All this is only the main effects of interference Russian language» [29, 12]. Eliminate the negative effects can be only one-way substitution alphabet. In the words of Professor A. Zhunisbek «... replacement of the alphabet do not have to be regarded as a rejection of a particular language or script, I repeat, is a graphical reform of the Kazakh language» [30, 7].

This reform begins with the design of the Latin alphabet. Currently represented by more than 100 varieties, among the authors of the Kazakh Diaspora and foreign-language specialists [31]. Development can be divided into three groups. The first focuses on the extended (with over – and subscript characters) Latin, aims to create a common Turkic graphics (A. Zhunisbek, etc.). The second sticking to the principle of «one sound one character» uses for the sounds, the designation of which is not on your keyboard, diacritical signs (R. Abdykadyrov, etc.). The third group uses the basic Latin alphabet characters, and for those that are not included on the keyboard uses the doubled characters

(A. Sharipbay, etc.). The last two lines are aimed at flawless use of computer programs. It is known that in the modern Kazakh alphabet has all the letters of the Russian language. This explains the different number of sound symbols represented in the new versions of the alphabets. Some authors (A. Zhunisbek, B. Kantarbayuly) offer a limited 28 signs that indicate specific sounds Kazakhs. Other (M. Malbakuily, A. Sharipbay) supporters 31 – character alphabet that includes a foreign language *ф, х, в*.

Spelling is closely related to a pronunciation. In connection with this provision, there is an inconsistency between projects 28 and 31 – letter alphabet. First for the restoration of native pronunciation norms of the Kazakh language and therefore suggests to get rid of borrowed sounds *ф, х, в*. Consequently, foreign words will be written like this: **халық** – *қалық*, **фабрика** – *пәбрика* or *пәбрике*, **вагон** – *багон* or *уагон*. Last for the preservation of sounds *х, ф, в*. Its orthograms look like this: **халық** – *халық*, **фабрика** – *фабрика* or *фәбрике*, **вагон** – *вагон* or *багон*.

Among the supporters of the preservation of alien sounds of many eminent specialists of the Kazakh language. The main arguments of

the majority of Russian linguists are terms that sounds, *ф*, *х*, have taken root in the language, articulation adapted. Therefore, new alphabet they should be.

Thus being offered two solutions to the problem: the first – to limit specific to the 28 letters of the Kazakhs and write how to pronounce the native Kazakh, the second – to leave in the foreign-language «*ф*, *х*, *ө*» and save the modern spelling. Despite the apparent contradiction, both projects provide a spelling reform. It is needed for the sake of creation for the younger generation of the national alphabet and development language norms.

Abstract

The article considered original graphics of the Kazakh language, and shows the influence of the Soviet Union's policy on the development of it. Presented spelling principles sound system transition Kazakh language to the Latin script. In 1938 borrowed words were written in the Latin alphabet «in Russian». In 1940, under the influence of national political forces of the USSR zone moved to the Cyrillic alphabet was compiled and reigning alphabet, complete with Russian letters, previously unavailable in the Kazakh language. That, in turn, contributed to the introduction to the language rules that are alien to the laws of its development. Distorted, it's incredibly complicated spelling. For this reason, several times processed spelling dictionaries. In 1929, in connection with the transition to the Latin alphabet in Kazakhstan was held spelling reform. Recognized the fundamental position expressed in the textbook of A. Baytursynuly and he noted the discrepancy nature of the Kazakh language pronunciation of the words of European origin. So he insisted on writing borrowed words according to the spelling of the local language. At present, the Kazakh language uses the Cyrillic alphabet in Kazakhstan, are discussing whether the return to Latin and Kazakh linguists link to solve this problem with spelling principles.

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CHOICE AND JUSTIFICATION OF THE INITIAL CHARGE IN PROCESSING MIDDLEINGS, RECYCLED MATERIALS AND SLAG LEAD PRODUCTION

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On the basis of thermodynamic calculations possibility of use of high-sulphurous components of copper-zinc ore as sulfidizing agents is shown. It is shown that at optimum value of a ratio of copper-zinc ore to quartz gumbol equal 1,5, the best technical and economic indicators of process of mine retractive melting are reached.

Keywords: pyrites, chalcopyrite, copper-zinc ore, furnace charge, distribution

The additional valuable components (e.g. metals) receiving from the accumulated and the current industrial products, the recycled material and the non-ferrous metallurgy industry wastes is presented itself the strategic challenge of the industry, in the context of the depletion of the primary sulfide – quality raw materials, the energy and materials costs rising for the production of metals.

Their joint melting in the blast furnace is one of the solutions, having aimed at the processing of the industrial products and the recycled materials of the lead production. So, the technology of the mine contractile melting has been established at the Ust-Kamenogorsk Metallurgical Complex LSP «Kazzink». The advantages and their disadvantages, as well as the theoretical aspects of this technology have already been presented in details in the papers [1–3].

So, it has already been established, that the observed metal redistribution towards the deterioration in the melting is closely related to the initial raw materials composition. Thus, to be achieved the high final results is virtually impossible, at the current structure of the initial raw materials.

The main aim of this work – is the theoretical estimates conducting of the metals distribution between the melting products at the optimized composition processing of the initial furnace charge of the mine contractile melting.

Materials and methods of research

The X – ray analysis of a number of the ore samples has already been carried out for the phase composition determination of the copper – zinc ore. As a result of the carried out studies, it has already been established, that Cu_2S , CuFeS_2 , FeS and ZnS are the main components of the copper – zinc ore. The copper and iron antimonides and arsenides, as well pyrite ones have also been discovered in the ore composition. The slag components, such as – quartz and calcium oxide, in the form of the clearly defined phases, are in the free state.

At the structuring of the initial furnace charge composition, the quantitative ratios of the basic components of the initial furnace charge – the copper slips, the converter slag, and the furnace charge contractile smelting (CS), have been left quite unchanged. The optimum amount of the copper – zinc ore has been determined by the calculation, having taken into account the copper, zinc, iron, silica, and sulfur content therein, and relating

to the different compounds. The metallurgical calculations of the initial furnace charge and the process material balance have already been carried out, having used the especially developed mathematical programs. The data from the factory practices and the results of the mineralogical studies on the modes of occurrence of the non – ferrous metals, arsenic and antimony in the components of the initial furnace charge and the smelting products have already been used in the calculations.

At the optimum flow of the copper–zinc ore selection, we have been assumed the integrated use possibility of the high sulfur its components (e.g. pyrite, chalcopyrite), as the sulphidation component. The thermodynamic calculations of the equilibrium interaction between the copper – zinc ore components with the slag – matte smelting components have been conducted under the «Aster» program, having used the «IVTANTHERMO» thermodynamic data base. Thus, the full potential minimization method of the Gibbs energy has been assumed, as the basis of the calculations.

The Gibbs energy interaction reactions between the oxides of the heavy non – ferrous metals, arsenic, antimony, and iron, as well as the copper and the iron intermetallic compounds (e.g. arsenides and antimonides) with the non – ferrous metals sulfides, the iron, and the high sulfur compounds of the copper – zinc ore and the products of their decomposition at the temperature 1473 and 1573 K have been already calculated. The results of the thermodynamic calculations have been confirmed the simultaneous use possibility of the high – sulfur components of the copper zinc ore, as the sulphidation component.

Results of research and their discussion

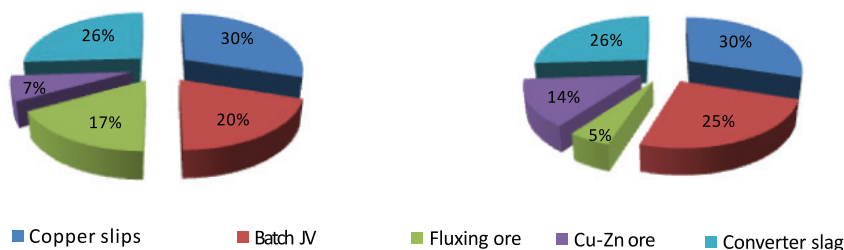
The calculated composition of the adjusted initial furnace charge of the mine contractile smelting (CS) has been presented in Figure. The comparative analysis of the material flows of the process at the processing of the existing initial furnace charge and the proposed corrected furnace charge of the new composition has been shown the significant quantitative changes of the resulted smelting products.

Ceteris paribus, at the processing of the furnace charge of the new composition it is observed the yield increase of the target products – e.g. the lead bullion and matte, up to 26 and 33 tons, respectively. This can be explained by the changes in the flow mechanism of the physical and chemical processes, having occurred in the melt. Thus, the lead bullion yield's increase, primarily, it is explained, due to its decrease of its content in the matte.

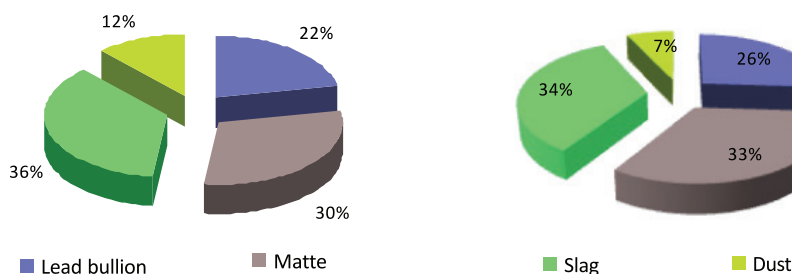
A slight increase in the matte output has been caused by the additional amount of the copper, having contributed by the copper – zinc ore, having reduced its content in the slag and the lead bullion. Reduction in the yield of the slag can be explained, in terms of the optimal selection of the slag components and the silica

maximum use, having had the composition of the main components of the furnace charge. For all this, it is observed the increase in the zinc content of slag up to 12% against 7%, having obtained during the processing of the initial furnace charge of the existing composition in practice.

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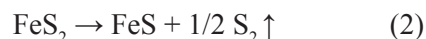
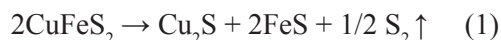
The Comparative Analysis of the Material Flows in the Processing of the Initial Furnace Charge of the Different Composition:

- a – the Initial Furnace Charge on the Existing Technology;
b – the Adjusted Composition of the Initial Furnace Charge.

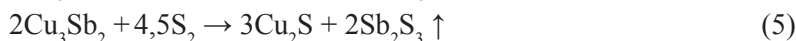
The analysis of the selected structure of the initial furnace charge has been shown, that during the furnace charge smelting of the already given composition, by the very mechanism of the process, it can be achieved the favorable conditions, having provided the poor copper and lead slag receiving. So, the preliminary calculations have already been shown, that this task will be more closed to the optimal solution, if to be impacted on the Fe–Cu–S–O system of the high-sulfur components of the copper-zinc ore before and after the slag phase formation. Thus, it is quite possible to be achieved the maximum transfer of the non – ferrous metals oxides into the sulfides, having concentrated them in the matte phase and, moreover, to be ensured the most complete impurities (e.g. Pb,

As, Sb) sublimation, in the form of their volatile compounds (e.g. sulfides).

On the basis of the thermodynamic calculations, when smelting the new composition of the furnace charge, it should be expected the dissociation higher sulfide compounds of the copper-zinc ore by the following reaction:



Having formed by the reaction (1) and (2), the additional amount of FeS and the excess sulfur will be reacted with the components of the slag – matte smelting, according the following reactions:



As a result of the magnetite content reduction in the slag (3), it is provided the copper and the lead reduction in the slag. So, the progress of the reactions (4)–(7) is promoted the content increase of the sulfide copper in the matte and the favorable conditions providing for the arsenic and the antimony sublimation. Thus, the components complex use of the copper-zinc ore is allowed to be solved a number of the following objectives: the copper and the lead

loss reducing with the slag on the one hand, and the obtained products quality increase, due to arsenic antimony deep sublimation, on the other hand. For all this, it is achieved the optimal distribution of the copper, lead, arsenic, and antimony between the smelting products.

The advanced process material balance during the processing of the initial furnace charge of the new composition has been given in the Table.

The Material Balance Mine Contractile Smelting Process at the Initial Furnace Charge Processing of New Composition

Name	Cu		Pb		Zn		Fe		As		Sb		S		SiO ₂		CaO		Πp.	Total:	
Uploaded:																					
	%,T	%	t	%	t	%	t	%	t	%	t	%	t	%	t	%	t	%	t	%, t	%, t.
CS Furn.Charge	25	21,2	5,3	22,8	5,7	8,8	2,2	14,8	3,7	0,8	0,2	0,4	0,1	7,2	1,8	2,7	0,67	3	0,7	4,63	25
Cu Slips	30	21	6,3	45,3	13,6	5,0	1,5	4,2	1,3	3,9	1,2	1,4	0,4	2	0,6	3,4	1,0			4,1	30
Convect.Slag	26	3,8	0,98	33,5	8,7	4,5	1,2	16	4,2	2,3	0,6	0,94	0,24			17,2	4,5	12,7	3,3	2,28	26
Cu-Zn Ore	14	2,4	0,34	0,37	0,1	3,7	0,52	26,6	3,72					31,2	4,4	15,5	2,2	14,0	1,96	0,76	14
Quartz Flux	5							3	0,15							71,8	3,6	3,6	0,18	1,07	5
Average Compos.of Furn.Charge	100	12,92		28,1		5,42		13,0		2,0		0,74		6,8		11,97		6,14		12,91	100
Received:																					
Lead Bullion	I	0,3		24,2					0,03		0,07		0,01						1,41		26
	II	1,2		93,1					0,12		0,27		0,05								
	III	2,3		86,1					1,5		9,5		0,2								
Matte	I	12,27		3,25		0,67		4,1	0,27		0,11		6,18		1,21				4,94		33
	II	37,2		9,85		2,03		12,42	0,82		0,33		18,73		3,66						
	III	95,0		11,6		12,4		31,5	13,5		15,0		91,0		10,1						
Slag	I	0,11		0,3		4,33		8,82	0,03				0,48		10,5		5,9		3,53		34
	II	0,31		0,83		12,0		25,9	0,08				1,33		30,8		16,4				
	III	0,8		1,1		80,0		67,8	1,5				7,0		87,7		96,0				
Dust	I	0,24		0,37		0,42		0,08	1,67		0,56		0,13		0,26		0,24		3,03		7
	II	4,8		4,63		5,25		1,6	20,9		7,0		1,63		3,25		3,0				
	III	1,9		1,2		7,6		0,7	83,5		75,5		1,8		2,2		4,0				
Total:		12,92		28,1		5,42		13,0		2,0		0,74		6,8		11,97		6,14		12,91	100

Notes: I – amount of, t.; II – composition, %; III – distribution, %.

When the selected composition of the initial furnace charge the technical and economic parameters of the process are being greatly increased: the copper extraction in the matte is achieved 95%, and the lead extraction in the lead bullion is increased from 70 up to 86%.

The Conclusions

1. It can be achieved the considerable improvement of the technical and economic indicators of the mine contractile smelting by the composition changing of the initial furnace charge.

It has also been established, that the favorable conditions are being created for the copper and the lead losses reduction with the slag and the arsenic and the antimony sublimation into the dust, at the flow increasing of the copper-zinc ore in the furnace charge.

2. The flow control and the ratio of the copper-zinc ore to the quartz flux in the ini-

tial furnace charge are allowed to be chosen the optimal value to be added to the initial furnace charge of the copper-zinc ore. For all this, the integrated use of the high-sulfur compounds of the ore, as the sulphidizer, has the fundamental significance on the metals equilibrium distribution between the smelting products.

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THE EXPANDED – CLAY CONCRETE WITH QUARTZ FILLER

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Analysis of the specific surface area of silica filler in the range of 100 to 900 m²/kg influence on the concrete density and compressive strength formation made. Conditions taken: cement content in concrete, filler content, the consistency of the concrete mix, the superplasticizer C-3 usage. Found that at low levels of cement clinker part in concrete (100...200 kg/m³) the silica filler with a specific surface of 100...900 m²/kg usage leads to concrete strength and density rise. While the filler specific surface area increase over than 500 m²/kg is not effective in terms of concrete strength increasing. With a high clinker cement content (450 kg/m³) up to 150 kg silica filler addition hardly changes the concrete density and strength. And it is expedient to use 100 m²/kg specific surface area filler.

Keywords: concrete, quartz filler, specific surface, compressive strength, superplasticizer

The requirements for the efficiency and durability of the concrete structures have already led to the widespread use in the cements with the mineral additives construction [3]. So, the mineral supplements are practically involved in the hydration reactions, as well as are made their influence on the concrete structures formation. The active mineral supplements are relative slowly involved in the hydration processes. Many authors have already noted the kinetics slowdown of the early strength cements with the mineral additives [2, 4]. The mineral additives are practically performed the fillers' function in the concrete for a long time [4]. The mineral supplements poly-functionality is usually explained by the heterogeneity of their mineralogical, phase, and particle-size distribution. For example, that there is some portion of the inert impurities, in the form of quartz, feldspar, mullite in the natural and technogenic pozzolans [1].

The Purpose of the Study. The purpose of the study – is to be improved the cements use efficiency with the mineral additives. In practice, the mineral admixtures cements are the most commonly used, having obtained by the co-milling, and their specific surface area is determined, in general. For all this, it is not quite clear, what the specific surface area of the cement clinker part and the mineral supplement are, separately. To be identified the role of the specific surface area of the binder components, it can be possible at the cements splitting use grinding.

The main objective has been to be studied the specific surface area influence and the mineral additives content on the structural ceramsite concrete properties.

Materials and methods of research

For the experiment, it has been used the separately blended cement grinding, having contained, as the mineral inert supplement 50% quartz filler. So, the clinker of the cement production of the CJSC «Ulyanovskcement» (Russia) with the specific surface area 400 m²/kg has had the following mineralogical composition: C₃S = 59%, C₂S = 16%, C₃A = 8%, C₄AF = 13%.

The studies have been performed on the ceramsite concrete dense structure, with the flow rate 0,9 m³ expanded clay in 1 m³ concrete. The samples of the 100×100×100 mm size cube have been molded from the aggregate ceramsite concrete mixtures. The ceramsite concrete compressive stress has been determined after the ceramsite humid heat treatment duration (e.g. 4 + 2 + 8 + 2) hours at the isothermal heating temperature 90°C. The ceramsite concrete average density has been determined in the dry condition.

Results of research and their discussion

The specific surface area influence of the quartz filler and its content on the compressive strength of the structural ceramsite concrete has already been studied. During the three-factor plan experiment execution, the mixed cement content (X_1) has been varied within the limits from 200 up to 600 kg per 1 m³ concrete, the specific surface area of the quartz filler (X_2) has been changed from 100 up to 900 m²/kg, the aggregate concrete mixtures stiffness (X_3) has been ranged within the limits from 5 up to 25 seconds on the technical viscometer.

At the confidence probability level 95%, the polynomial regression model has been obtained, depending on the ceramsite concrete compressive strength (Y), MPa, from the variable parameters, which has the following form:

$$Y = 15,8 + 8,7X_1 + 1,2X_2 + 5,8X_3 - 0,5X_1^2 = 1,2X_2^2 + 1,0X_3^2 + 3,0X_1X_3.$$

So, the graphic dependence of the ceramsite concrete compressive strength of the investigated parameters has been shown in the Fig. 1.

So, the obtained results' analysis has been shown, that all the variable factors are quite significant. The cement content of the concrete and the concrete mixture stiffness are the

most significant factors. The carried out studies have already been shown, that the specific surface area increase of the quartz filler in the range from 100 up to 500 m²/kg, is promoted the increase ceramsite concrete strength over the whole entire change range of the cement content. The further increase in the specific

surface area of the filler in the range of 500 up to 900 m²/kg is hardly affected the ceramsite concrete strength. It, moreover, has been established, that the influence degree of the specific surface area of the filler on the ceramsite concrete strength is depended on the cement content: the smallest increment of the concrete strength (e.g. about 6%) is observed in the compounds with the mixed cement content

600 kg per 1 m³ of the concrete (e.g. 300 kg of the clinker cement). When the content of the mixed cement is equal to 200 kg per 1 m³ of the concrete, the growth concrete strength from the specific surface area increasing of the filler has been made up 18–80%. So, the less increase of the strength (e.g. 18%) has been observed in the mixtures with its stiffness of 25 seconds.

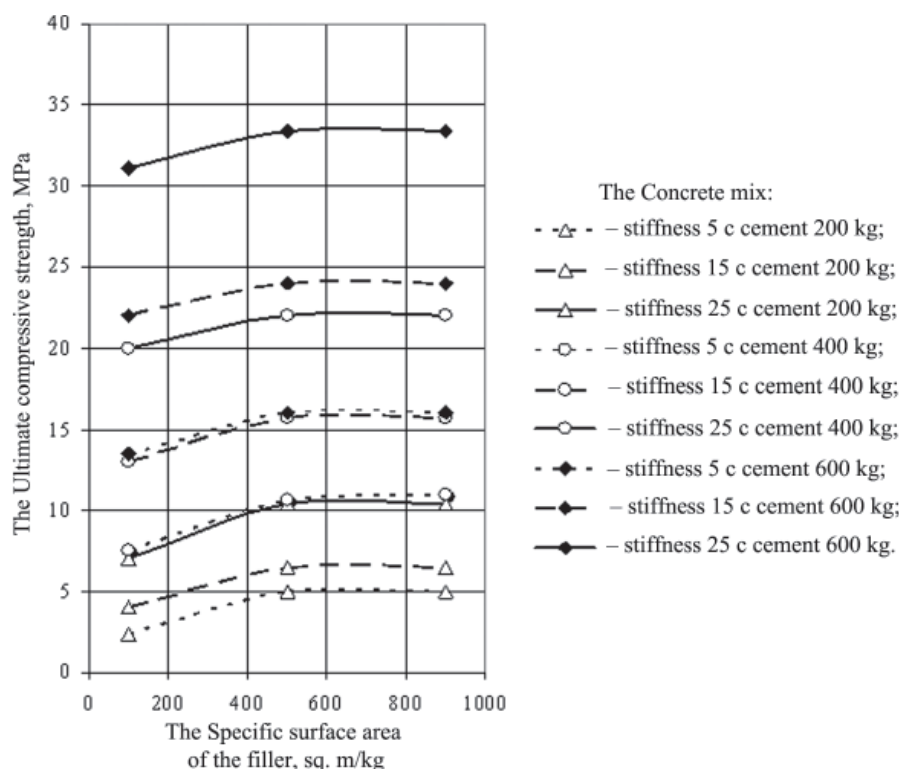


Fig. 1. The Specific Surface Area Influence of Quartz Filler on the Compressive Ultimate Strength of the ceramsite concrete, MPa, based on the Cement with Filler Content 50%

The content influence and the specific surface area of the quartz filler in the ceramsite concrete compositions separately with low (e.g. 150 kg) and high (e.g. 450 kg) content of the clinker cement has been studied. The ceramsite concrete compositions, having prepared from the stiffness mixtures of 15 seconds have been compared. The quartz filler has been entered into the compositions with the specific surface area 100 and 500 m²/kg, in the amount of 50...259 kg per 1 m³ of the concrete. The quartz filler content influence, its specific surface area and the content of the super-plasticizer C-3, in the amount of 0,5% from the cement weight on the compressive ultimate strength of the ceramsite concrete have been shown in Fig. 2.

The obtained results' analysis has been shown, that at the cement content in the 150 kg concrete the increase in the amount of up to

150 kg filler is been led to the increase of the ceramsite concrete strength. So, the carried out studies have been shown, that the filler with the specific surface area 500 m²/kg have been allowed, to a greater extent, to be improved the concrete structure strength and its seal. The specific surface area and the filler content influence on the concrete's average density have been shown in the Fig. 3.

At the high content of the cement clinker part (e.g. 450 kg/ m³), the introduction up to 150 kg of the quartz fillers is hardly changed the concrete density and its strength. For all this, it is quite advisable to be used the filler with its specific surface area 100 m²/kg, at the energy consumption reduction for the filler grinding. Thus, the obtained result has its great significant for the compounds optimization of the self – compacting concrete types.

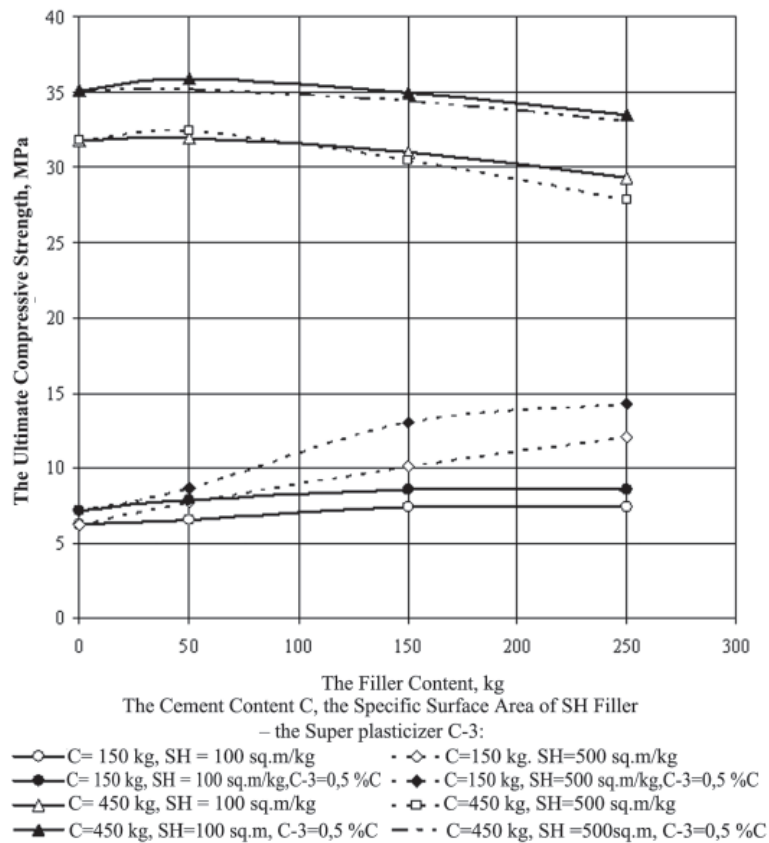


Fig. 2. The Quartz Filler Content Influence, its Specific Surface Area, and 0,5 % from the Super-plasticizer C-3 Cement Weight on the Compressive Ultimate Strength of the Ceramsite Concrete, MPa

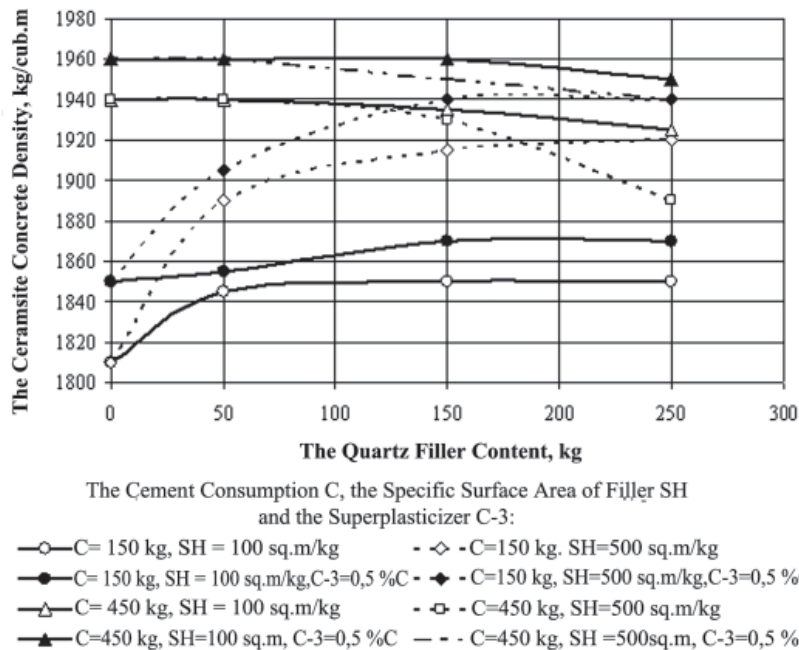


Fig. 3. The Quartz Filler Content Influence, its Specific Surface Area and Super – Plasticizer C-3 Presence on the Ceramsite Concrete Average Density

Conclusions

Thus, the already performed experiment has already been shown, that the fillers are practically led to the concrete strength growth, if they are increased its density. The specific surface area and the fillers content influence on the structural ceramsite concrete strength are completely depended on the cement consumption in the concrete.

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THE DEVELOPMENT OF TECHNICAL SOLUTIONS ON DECREASING THE INFLUENCE OF TOXIC MICROIMPURITIES IN BEER ON THE CONSUMER

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In the article the stages modernization of brewing classical technology is proved and offered, on these stages the critical control points demanding the reduction of the toxic microimpurities impact of beer on the target organs and functional systems of consumers are determined. The developed complex of technical and technological decisions has an advance scientific and technical level corresponds to European phytopharmaceutical course of development in brewing and this complex can be a base of the offers from the Russian Federation to WTO and Custom Union countries.

Keywords: beer, target organs, microimpurities, brewing raw materials, ozone-aided sterilization, a low-temperature brewing copper, yeast, glycolysis, propagator, plasmolyzate, biological value

The discussion between national research schools about benefit and harm of beer doesn't cease.

Recently the German public tends to transfer consumers to non-alcoholic beer [1] whereas in Scotland there is a prevailing tendency of superstrong beer production (Armageddon with a strength of 65 % and Snake Venom with a strength of 67,5 %), received by modern technology of cold («frosty») distillation [2].

The domestic modern medicine saved up statistically reliable information about evolution dynamics of «beer alcoholism» among just as children so teenagers [3; 4; 5; 6].

Considering known information about the target organs, damaged by beer microimpurities, we developed and patented the technology of producing beer possessing tyre-tread properties [7]. The main point of a proposed technical solution is to add the biological active agents having tyre-tread effect on target organs in pharmacological significant doses in ready beer. We established that entering of adaptogenes, hepatoprotectors, antioxidants and anti-carcinogens in combination with plasmolyzate of the fulfilled beer yeast doesn't distort a typical flavor-aromatic bouquet of real beer brands. Thus the biological value of beer which we suggest to estimate on the general mineralization (the bottom ash), total vitaminization (concentration of seven vitamins) and on a prebiotic saturation (the maintenance of the dry rest) increases.

Now we develop a complex of scientific and technical decisions to eliminate getting in ready beer the most toxic microimpurities, characteristic for classical technologies of brewing.

Having analysed in brewing actual practice life cycle of beer production by means of technological testing on typical lines we established, using the principles of HACCP, three main critical control points demanding moni-

toring and modernization of technological process stages: raw grain storages, hop and mash boiling, and also the organization and carrying out the main (basic) fermentation.

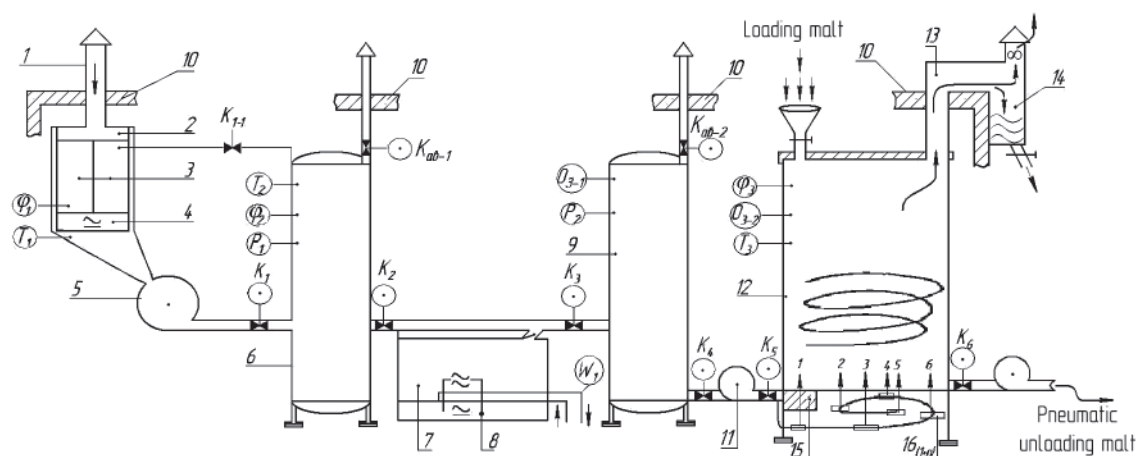
Raw grain storage

Still the problems of the ready beer safety caused by the presence of field microbiotas and by diseases of raw grain storage aren't solved. The experience of the Danish brewers, who tried to fight against field microbiotas by methods of before-storage grain disinfection, appeared to be inefficient and fraught with injection of chemical toxicants into grain raw material. Also the existing methods of deratization and disinsection, and as well as grain treatment in storages appeared to be inefficient. Preparations of copper, mercury and organochlorine compounds are capable to strengthen even more the load on a liver and other bodies of the organism detoxication system. However the untreated brewing grain raw materials is the reason of emerging of aflatoxins, ochratoxin A, deoxynivalenon and others contaminants in ready beer [8].

We developed the device of grain brewing raw materials sterilization on the initial stage of brewing that excludes the possibility of getting the grain microbiotas toxicants in a mash (Figure).

The periodic ozone-aided drying and grain sterilization before crushing allow to lessen the number of microbiotas on 3–4 levels (Table).

The application of the method will allow to remove the question about permissible norms of beer pollution by mycotoxins and others contaminants: there just should not be any aflatoxins and enterobacteria in beer. We suggest to consider their detection in any volume of test as processing deficiency. The offered method is applicable in fight against diseases of grain storage as well as at elevators instead of an existing energy consumption thermal drying.



Micronization efficiency indicators

Treatment method	Time, sec	Moisture content, %	Starch, % DS	Dextrines, % DS	Reducing sugars	Amine nitrogen, mg/100 g
Extrusion	12	9,5/14	57,8/60,5	8,2/0,1	6,58/1,2	47,5/39,6
Barohydrothermal treatment	10–50	12,6/12,1	50/62,0	–	0,6/0,31	47,4/39,4
Micronization	30	27/11	44/55	6,8/0,09	1,22/0,61	–

Notes:

1. Post-treatment indicators are given in a numerator, indicator value of a control sample is given in a denominator;
2. DS – dry solids.

Hop and mash boiling

Long ago it is proved that liver injury among beer fans happens not from excess of alcohol, but from ions of copper which diffuse under the influence of alcohol and acetic acid from copper surfaces of being cooled tubes and filtration sieves and which is dissolved in fermenting mash. The replacement of all copper details in the processing equipment is recommended for process “improvement”, as well as it is forbidden the application of the technological additives containing formaldehyde or cobalt salts. World experience showed that the process of hop and mash boiling itself inevitably increases the toxicity of beer. It is established that during hop and mash boiling, except formation of psychotropic connections, hard resins pass from hop to beer. These hard resins are responsible for rectum carcinogenesis at 5 % of beer fans.

Considering the world tendencies of brewing [9] directed on using the potential of monomeric heterocyclic polyphenols of hop and hop products, to which flavonoid xanthohumol possessing the expressed anti-virus properties belongs, we developed a construction of a brewing copper and boiling modes, allowing to save

useful properties of hop oil preparations, first of all, of xanthohumol. The developed construction of a low-temperature brewing copper with a total automation equipment allows to operate in an automatic mode the mash quality at essential lessening in energy consumption on boiling and the subsequent mash cooling (patent 97130) [10].

Organization of the main (basic) fermentation

Our research showed that today the process of the main fermentation is impossible mixture of two biotechnological processes demanding for optimization of various biological functions by yeast mutually exclusive technological conditions: aerobic high-temperature (+35 °C) conditions for yeast biomass growth and anaerobic low-temperature (from +4 to +8 °C) conditions for yeast glycolysis realization. We developed the optimized designs of the propagator for reproduction of seed yeast (patent 98001) [11] and of the main fermentation tank (patent 2423417) [12] and proved the management criteria of these processes. Namely: the process of reproduction should be carried out before the reaching of the yeast residual

quantity necessary for ethanol production in the set volume during the glycolysis process. Plus the ratio of concentrations alcohols/carbohydrates is supervised and regulated automatically and defines finishing dates of the main fermentation, at that fractional addition of demanded amount of carbohydrates prevents the formation of toxic BPF (by-product fermentation) because of an inevitable polyauxy at deficiency of sugars.

Increase of biological value of beer

We suggest to use widely the new technical solution providing the content increase of the bio-elements, vitamins and biologically active agents in beer and consisting in addition into beer 3–8% cooled native plasmolyzate of the fulfilled beer yeast (TS 9184-001-56090574-2012) [13]. Thus in the quality standard of beer recommended for the WTO countries we offer following content norms of the bottom ash not less than 1,8 g/dm³, the dry rest not less than 50 g/dm³ and the total content of seven vitamins not less than 9,46 mg/dm³ at average concentration of vitamins and vitamin-like connections about 210 mg/dm³ [14].

Summary

The decrease of toxic influence of beer microimpurities on target organs and functional systems of consumers can be provided technologically. The technology of the brewing process improvement, including ozone-aided sterilization of grain brewing raw materials, low-temperature mash boiling without hop and the modification of the main fermentation with the prevention of toxic by-products accumulation is offered.

We consider the optimum decision, excluding entering of mycotoxins and enterobacteria in ready beer, the necessity of the ozone-aided sterilization of grain brewing raw materials. The low-temperature mash boiling without hop will allow to exclude the contact of the consumer with the hop cancerogenic hard resins whereas the management modernization of the main fermentation will allow to lower possibility of toxic BPF (by-product fermentation) formation. The application of the fulfilled beer yeast plasmolyzate into beer allows to provide the increase of biological value of beer.

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Materials of Conferences

«CONCENTRATION WAVES» MODEL FOR THE TRIBOLOGIC SYSTEM CM1/LL,°/CM2

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Model of non-interacted «concentration waves». The «third body» of the complex tribologic system CM1/LL,°/CM2 is presented by wear products of the composition materials CM1 and CM2 and the liquid lubricant (LL). In this case the volume concentration of the solid components is may be presented by next relation:

$$\alpha = \langle \alpha \rangle - \Delta \alpha = \langle \alpha \rangle / (1 + \alpha_{LL}),$$

$$f_i^* = f_i^o - \Delta f_i \cong f_i^o - (\Delta \delta_i - \Delta \alpha_i) (f_{sol,i}^o - f_{LL}^o) - (\delta_i + \alpha_i - 1) (f_{lub,i}^o - f_{LL}^o);$$

$$I_i^* = I_i^o - \Delta I_i \cong I_i^o - (\Delta \delta_i - \Delta \alpha_i) (I_{sol,i}^o - I_{LL}^o) - (\delta_i + \alpha_i - 1) (I_{lub,i}^o - I_{LL}^o),$$

where $\delta_i \cong 2\alpha_i^2 (1 - \alpha_i)$ and $\Delta \delta_i \cong 2\alpha_i \Delta \alpha_i (3\alpha_i - 2)$ are the relative value of the synergic effect and the change of its for surface of the i-composition ($i = 1, 2$) by friction, and $\Delta \alpha_i \cong \alpha_i \alpha_{LL} / (1 + \alpha_{LL})$ is the change of the volume concentration for according solid component.

It's need to note, this additive model of non-interacted «concentration waves» are may be used for prediction of CM properties in any tribologic systems [1–4].

Model of interacted «concentration wave». The tribologic properties of the compositional materials CMi ($i = 1, 2$) in CMi/°/CMi systems are may be calculated by next relations:

$$f_i^o = f_{lub,i}^o + (\langle \alpha_i \rangle - \langle \delta_i \rangle) (f_{sol,i}^o - f_{lub,i}^o);$$

$$I_i^o = I_{lub,i}^o + (\langle \alpha_i \rangle - \langle \delta_i \rangle) (I_{sol,i}^o - I_{lub,i}^o),$$

where $(f_{sol,i}^o, I_{sol,i}^o)$ and $(f_{lub,i}^o, I_{lub,i}^o)$ are the sets of the properties values of the solid (with average concentration $\langle \alpha_i \rangle$) and lubricant CMi components according to «standard scale», the symbol ° is denotes

$$I_{lub,i} = [1 - (1 - \gamma_{lub} - \gamma_{LL}) \mu_{lub}^2 / (1 + \gamma_{lub} + \gamma_{LL}) (1 + \mu_{lub})] I_{lub,i}^o;$$

$$I_{sol,i}^o = [1 - (1 - \gamma_{sol}) \mu_{sol}^2 / (1 + \gamma_{sol}) (1 + \mu_{sol})] I_{sol,i}^o,$$

the value

$$\alpha = \langle \alpha \rangle - \Delta \alpha = (\alpha_1 I_{sol,1} + \alpha_2 I_{sol,2}) / (I_{sol,1} + I_{sol,2}) (1 + \alpha_{LL})$$

– is the concentration of the solid components into TB volume.

The relative synergic effects are may be presented by following relations:

where $\langle \alpha \rangle$ is the average concentration of the solid components without taking into consideration the volume share of the LL and the change of α is the following $\Delta \alpha = \langle \alpha \rangle \alpha_{LL} / (1 + \alpha_{LL})$.

If the tribologic properties () of the compositional materials CMi ($i = 1, 2$) in CMi/°/CMi systems are may be calculated by next relations:

$$f_i^o = f_{lub,i}^o + (\alpha_i - \delta_i) (f_{sol,i}^o - f_{lub,i}^o);$$

$$I_i^o = I_{lub,i}^o + (\alpha_i - \delta_i) (I_{sol,i}^o - I_{lub,i}^o),$$

then the properties of these materials in system CM1/LL,°/CM2 are may be calculated by the following formulae:

the «third body» (TB) without liquid lubricant (LL), δ_i – are the relative synergic effect for each system [5]. The interacted «concentration waves» from each CMi are determine the composition of the TB. Then the additive model of the friction coefficient and the sum velocity of linear wear calculation may be presented by next formulae:

$$f = f_{lub} + (\alpha - \delta) (f_{sol} - f_{lub});$$

$$I_i = I_{lub,i} + (\alpha_i + \delta_i) (I_{sol,i} - I_{lub,i}),$$

where:

$$f_{lub} = (1 + \mu_{lub} \gamma_{lub} + \mu_{LL} \gamma_{LL}) f_{lub,2}^o / (1 + \mu_{lub} + \mu_{LL});$$

$$f_{sol} = (1 + \mu_{sol} \gamma_{sol}) f_{sol,2}^o / (1 + \mu_{sol});$$

$$\mu_{lub} = I_{lub,1}^o / I_{lub,2}^o; \quad \gamma_{lub} = f_{lub,1}^o / f_{lub,2}^o;$$

$$\mu_{sol} = I_{sol,1}^o / I_{sol,2}^o; \quad \gamma_{sol} = f_{sol,1}^o / f_{sol,2}^o;$$

$$\mu_{LL} = I_{LL}^o / I_{lub,2}^o; \quad \gamma_{LL} = f_{LL}^o / f_{lub,1}^o;$$

$\delta_i \cong 2\alpha_i \langle \alpha \rangle (1 + \alpha_{LL} - \langle \alpha \rangle) / (1 + \alpha_{LL})^3$ (for the velocity of linear wear) and

$\delta \cong 2 \langle \alpha \rangle^2 (1 + \alpha_{LL} - \langle \alpha \rangle) / (1 + \alpha_{LL})^3$ (for the friction coefficient).

It's need to note, this additive model of interacted «concentration waves» are may be used for prediction of CM tribologic properties in some systems [5–7].

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«CONCENTRATION WAVES» MODEL FOR THE TRIBOLOGIC SYSTEM CM1°/CM2

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Model of non-interacted «concentration waves». In simple case the tribologic system from two compositional materials (CM1 and CM2) may be presented by following scheme CM1°/CM2, where the symbol ° is denotes the «third body» without liquid lubricant. The composition of «third body» is the result of the «concentration waves» addition from CM1 and CM2. Then the friction coefficient and the sum velocity of linear wear are the following:

$$f = (I_1 / (I_1 + I_2)) f_1^\circ + (I_2 / (I_1 + I_2)) f_2^\circ = \\ = (I_1 f_1^\circ + I_2 f_2^\circ) / (I_1 + I_2);$$

$$f_{lub} = (1 + \mu_{lub} \gamma_{lub}) f_{lub,2}^\circ / (1 + \mu_{lub}) = (1 + \mu_{lub} \gamma_{lub}) f_{lub,1}^\circ / (1 + \mu_{lub}) \gamma_{lub}; \\ f_{sol} = (1 + \mu_{sol} \gamma_{sol}) f_{sol,2}^\circ / (1 + \mu_{sol}) = (1 + \mu_{sol} \gamma_{sol}) f_{sol,1}^\circ / (1 + \mu_{sol}) \gamma_{sol};$$

$$I_1 + I_2 = I_1^\circ + I_2^\circ,$$

where (f_1°, I_1°) and (f_2°, I_2°) are the tribologic properties of the CM1 and CM2 in the CM1°/CM1 and CM2°/CM2 systems, accordingly. The CM1 tribologic properties are may be calculated by next formulae:

$$f = (I_1 f_1^\circ + I_2 f_2^\circ) / (I_1^\circ + I_2^\circ);$$

$$I_1 = (f_1^\circ - f) (I_1^\circ + I_2^\circ) / (f_1^\circ - f_2^\circ);$$

$$I_2 = (f - f_2^\circ) (I_1^\circ + I_2^\circ) / (f_1^\circ - f_2^\circ).$$

If the relative synergic effect for each CM is the next relation:

$$\delta_i = 4\alpha_i^2 (1 - \alpha_i) [1 - k_i (1 - k_{n,i})] \cong 2\alpha_i^2 (1 - \alpha_i)$$

$$(\text{by } \alpha = \alpha_i \text{ and } k_i \cong 0,5; k_{n,i} \cong 0),$$

the common synergic effect may be determined by following form: $\langle \delta \rangle = 2 \langle \alpha^2 \rangle (1 - \langle \alpha \rangle)$, where: $\langle \alpha \rangle = (\alpha_1 I_1 + \alpha_2 I_2) / (I_1^\circ + I_2^\circ)$ is the average concentration of the CM1 & CM2 solid components into the «third body» volume. It's note, this additive model of non-interacted «concentration waves» are may be used for prediction of CM tribologic properties in some systems [1–5].

Model of interacted «concentration waves».

The tribologic properties of the compositional materials (CM) CMi ($i = 1, 2$) in CMi°/CMi systems are may be calculated by next relations:

$$f_i^\circ = f_{lub,i}^\circ + (\alpha_i - \delta_i) (f_{sol,i}^\circ - f_{lub,i}^\circ)$$

$$I_i^\circ = I_{lub,i}^\circ + (\alpha_i - \delta_i) (I_{sol,i}^\circ - I_{lub,i}^\circ)$$

where $(f_{sol,i}^\circ, I_{sol,i}^\circ)$ and $(f_{lub,i}^\circ, I_{lub,i}^\circ)$ are the sets of average properties values of the solid (with concentration α_i) and lubricant CMi components according to «standard scale», the symbol ° is denotes the «third body» without liquid lubricant, δ_i – are the relative synergic effect for each system.

Let's assume that the interacted «concentration waves» from each CMi are determine the composition of the «third body». Then the additive model of the friction coefficient and the sum velocity of linear wear calculation may be presented by next formulae:

$$f = f_{lub} + (\langle \alpha \rangle - \langle \delta \rangle) (f_{sol} - f_{lub});$$

$$I_i = I_{lub,i} + (\langle \alpha \rangle + \langle \delta \rangle) (I_{sol,i} - I_{lub,i}),$$

where

$$\mu_{lub} = I_{lub,1}^0 / I_{lub,2}^0 ;$$

$$\gamma_{lub} = f_{lub,1}^0 / f_{lub,2}^0 ;$$

$$\mu_{sol} = I_{sol,1}^0 / I_{sol,2}^0 ;$$

$$\gamma_{sol} = f_{sol,1}^0 / f_{sol,2}^0 ;$$

$$I_{lub,i} = [1 - (1 - \gamma_{lub}) \mu_{lub}^2 / (1 + \gamma_{lub})(1 + \mu_{lub})] I_{lub,i}^0 ;$$

$$I_{sol,i} = [1 - (1 - \gamma_{sol}) \mu_{sol}^2 / (1 + \gamma_{sol})(1 + \mu_{sol})] I_{sol,i}^0 ;$$

the value $\langle \alpha \rangle = (\alpha_1 I_{sol,1} + \alpha_2 I_{sol,2}) / (I_{sol,1}^0 + I_{sol,2}^0)$ – is the average concentration of the solid components into «third body» volume [6].

The relative synergic effects are may be presented by following relations:

$$\delta_i = 4\alpha_i^2 (1 - \alpha_i) [1 - k_i (1 - k_{n,i})] \cong 2\alpha_i^2 (1 - \alpha_i)$$

(for the velocity of linear wear) and

$$\langle \delta \rangle = 2 \langle \alpha \rangle^2 (1 - \langle \alpha \rangle) \quad (\text{for the friction coefficient}).$$

It's need to note, this additive model of interacted «concentration waves» are may be used for prediction of CM tribologic properties in some systems [5, 7].

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RATIONAL TECHNOLOGICAL RESOURCE BASE AS MODEL OF INNOVATIVE DEVELOPMENT OF ENGINEERING EDUCATION

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The quality of modern engineering education (EE) is determined by fundamental training and aducation on the basis of the latest achievements of science. Imperative is creation of educational – scientific – production base (of technological resource base) training [1]. Technological resource base (TRB) is the basis for the formation of the technological subsystem of the university [2].

Conceptual positions on the formation of technological subsystems of system education of the university

1. *High importance of practical traning of the modern engineer.*

Distinctive feature of the present stage of development of EE is the increase in the importance of practical training of students. In structure of professional educational programs this kind of training has to make not less than 50-60 % from the general budget of time.

2. *Strengthening of technological resource base – the strategic direction of development of engineering education.*

According to the Federal Target Programme for the Development of Education for 2013–2020 gg an increase in funding for education is provided. Thus the greatest sum of money is aimed to EE development. The increase in expenses at EE is connected first of all with strengthening of technological resource base: updating of the equipment, creation of computer and multimedia audiences, acquisition of the modern software, development of telecommunications, etc.

Such attention of the state to EE is related with the economy country; its technical potential entirely depends on efficiency and quality of engineering education.

3. *Technological resource base – a factor of efficiency and quality of EE.*

The state quality system includes quality control, of execution of the federal state educational standards of higher education, which set out the requirements for equipment of laboratories, computer laboratories, multimedia audiences, as well as to the quality of educational training services using TRB. This attention to quality TRB by the monitoring system state indicates its special importance in the learning process, which reflects its the bond with the efficiency and the quality of the EE.

All this allows you to project the structure of the technological subsystem: educational equipment, scientific equipment, learning resources

production, marketing center, service center and a center monitoring the quality of educational services and technologies.

The structure of subsystem is different in integrity and autonomy, all components are interconnected. The subsystem is connected with other subsystems, of the system of education of the university: pedagogical, financial – economic, scientific, production, system management.

The economic aspect of projecting of rational technological resource base

Financial contents of the subsystem, primarily the acquisition and buy of equipment requires the associated costs. At present procedure of replacement of the old equipment and purchase of the new one contains elements of stochastic character in university, not supported by objective indicators. Besides there is no system of indicators reflecting the bond between of the costs of training with TRB use, and the quality of educational services training of professional competencies Existence of such indicators solves a problem of an inefficient expenditure of the income of the university connected with acquisition and development of the new equipment. Furthermore, they allow to manage rationally (reasonably) the incomes at production of educational services training of professional competencies at each grade level of training. The offered economic aspect is directed to creation of rational TRB that is an innovative factor in EE development.

Projecting such a system, is advisable to perform on base a synergistic approach to the education system of the university [3]. The rational TRB is an innovation in self-organization of the education system of the university.

Bases of synergetic approach

It is important that educational services cover all levels of an education system for self-organization education system [4]. For example, educational services on training professional competencies are used in training in educational laboratories and scientific laboratories and work practice at manufacturing enterprises. All resources of educational services are used in these processes of training: humans (administration, professors, teachers etc.), information (educational the program, curricula, educational and methodical grants, textbooks, etc.) and materials (resource base, other means of technical support).

It is expedient to establish quality of educational services on the basis of results system multilevel economical – pedagogical monitoring. The system of indicators of resources of educational services is formed during level monitoring: educational (the first level), the scientific (the second level) and the production (the third level) on the resource base, during preparation stage. It is offered to consider educational process at three levels using the whole equipment at each level carrying out monitoring.

It is necessary for this research:

- to differentiate professional competences picking out professional-active component, his quality accord quality training with using TRB;
- to elaborate the cycle of quality of training professional competences on each equipment of each level is.

However according to FGOS these processes represent the uniform educational process student training in every direction training. The principles of systemacity and continuity must be carried out for this proress. Performance of these principles is a link for three levels of training and promotes change of a qualitative condition system during its development.

Each level monitoring allows to introduce an element of organization in the education process using all the resource base of each level learning (initial stage complex system formation). However, the principles of systemacity and continuity must be executed in every direction training. Therefore the organization of the learning process at every level, will be directed also on the organization of the educational process learning professional-active component of the professional competences of whole direction of learning. Topologically correct organization of the subsystems leads to the time of exacerbation, the moment of maximum development of the system, of a synergistic effect. «Higher rates of development will be set in the whole domain. The whole develops its constituents. It is profitable to grow together, because this results in a saving of material, spiritual and other costs» [5]. It can be assumed that the attractor is a fundamentally new organization of training, the result of which is to improve the efficiency and quality of education.

Self-organization of a technological subsystem will promote dynamic balance of an economic subsystem, its self-organization with a steady trajectory of development which is defined by rational and effective use of the income university as a result of projecting of rational TRB of training.

However, if self-organization acts as the objective basis for activation of development of system, the organization is way of ordering of this initiative. Self-organization can lead to negative consequences therefore it needs adjustment and support from management parameters. Therefore the purpose of management is creation of conditions for the coordinated interaction of all resources of educational services of a technological subsystem, and also the coordinated interaction all subsystems, their functioning and existence as a whole, provided preservation and development of an education system of university, creating conditions for development of communicative communications between subsystems of an educational complex [6].

On the basis of monitoring researches it is expedient to develop economic-mathematical

model of TRB, as model of innovative development of EE.

Application of information technologies will allow to create an automated control system that is directed on improvement of quality and efficiency of EE and at a rational expenditure of the income of university.

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Short Reports

THE MODIFIED CEMENT PASTE HARDENING WITH CARBONATE FILLER

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The cement paste modified with carbonate filler hardening kinetics investigated. The following conditions taken into account: the content of carbonate filler varied from 0 to 35 %, the content of superplasticizer Glenium®51 was 0.5 % of cement weight. Found that when the self-sealing cement pastes carbonate filler content reaches 12 % modified cement stone strength does not reduce. The cement pastes with up to 35 % carbonate filler content increasing get 16 % compressive strength reduce. The carbonate filler content increase up to 35 % of a mixed binder weight does not retard the strength kinetics growth. After 3 days compositions gain 80 %, and after 7 days – 90 % of the 28 days strength. The self-compacting concrete compositions carbonate filler application is aimed to the rational use of local mineral resources and reduce the construction cost.

At present, much attention is practically paid to the rational and the integrated use of the local mineral resources, production, and distribution of the environmentally friendly building products challenges. The local mineral resources application is reduced the transportation costs and the construction projects ones. In particular, the long – term integrated use of the environmentally friendly carbonate rocks screenings crushing, which are widely prevalent in many regions [3]. So, the soft carbonate rocks' grinding is not required a lot of energy consumption. The grinding product, as the filler, can be used in the cements', concretes', and dry construction mixtures' compositions [4]. It, moreover, quite well known, that the calcite and dolomite are exhibited high level adhesion to the cement paste. That is why, many researchers have already noted, that high level is the consequence of their physical and chemical interactions at the phases' boundary interface [2, 3, 5].

In the self – compacting concretes' compositions, the number of the carbonate filler amount administrated may be further increased, in comparison with that is present in the cement. The study of the carbonate filler content influence in the cement on the growth kinetics of the self – compacting mixtures strength is presented itself the special interest. So, the carbonate filler content further increase should not to be led to the significant reduction in the strength, as well as slower growth kinetics strength of the mixed and blended cement [1].

The Purpose of the Study. Thus, the purpose of the study – is to be determined the filler use efficiency and its effectiveness from the local carbonate rocks in the compositions of the self – compacting

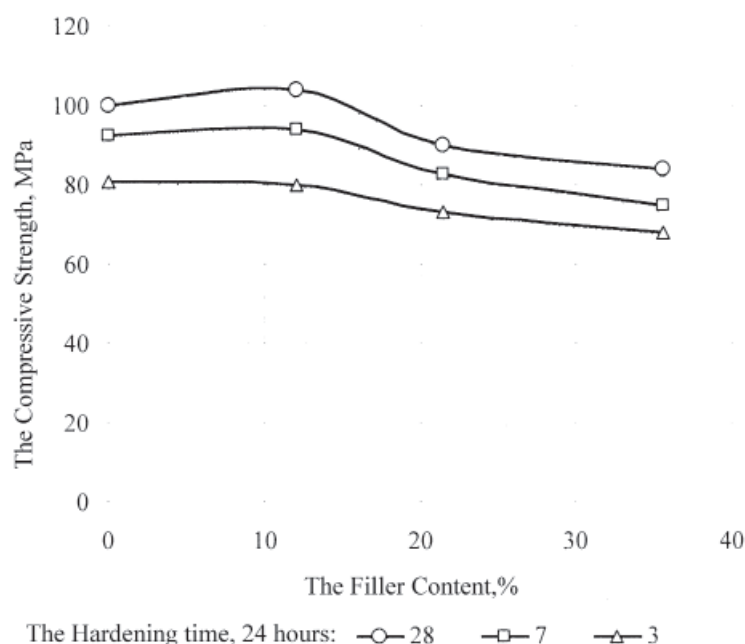
modified cement pastes. The main objective was to study the content impact of the carbonate filler on the strength formation and the self – compacting cement pastes' hardening kinetics, having modified by the «Glenium®51» super-plasticizer.

Materials and methods of research. As the binding material, the clinker Portland cement, with the specific surface area 350 m²/kg, has been used. The clinker's mineralogical composition has been, as the following: C₃S = 59 %, C₂S = 16 %, C₃A = 8 %, C₄AF = 13 %. The carbonate filler has been obtained by the grinding crushing screenings of the carbonate rocks, having consisted of the limestone and the dolomite. The dolomite content has been made up 81 %. The carbonate filler has been milled up to the specific surface area 350 m²/kg. The calcareous filler has been used, as the aqueous slurry.

As the modifying additive, the «Glenium®51» poly-carboxilate super-plastilizer of the «BASF» company has been used. The self-compacting cement pastes have been prepared, with the 125 ± 5 mm blurring, when tested in the Hagerman cone from the cement mixture, the carbonate filler, water, and the «Glenium®51» super-plastilizer additive, in the amount of 0,5 % from the cement weight. The samples, with their 20×20×20 mm size, have been molded from the cement pastes. Then, the samples have been hardened in the water at 20 ± 2 °C temperature. The compressive strength of the modified cement paste has been determined after the 3, 7, and 28 calendar days.

Results of research and their discussion. The composition, the strength results of the study, and the hardening kinetics of the modified cement pastes, depending on the carbonate filler content, have already been given shown in the Figure and in the Table.

Thus, it has been determined, when the content in the cement is up to 12 % carbonate filler, the modified cement paste strength is not practically reduced. The obtained result is explained in the minor changes of the aqueous cement and the aqueous solid ratios, in comparison with the composition on the clinker cement. The further increase in the carbonate filler content in the two – component cement from 0 up to 35,5 % is accompanied by the growth of the aqueous cement ratio of the self-compacting modified cement pastes from 21,75 up to 33,15 %, and, moreover, by the compressive strength decrease of the cement paste for 16 %. The carbonate filler content increase up to 35 % by the two-component binder weight is not slowed the strength growth kinetics. So, after three calendar days (e.g. 72 hours) the compositions are being gained 80 %, and after 7 days (e.g. 168 hours) – 90 % from the 28 day (e.g. 672 hours) strength.



The Growth Kinetics of the Compressive Strength of the Self – Compacting Modified Cement Pastes, Depending on the Cement Carbonate Filler Content

The Cement Pastes Composition with the Carbonate Filler and the «Glenium®51» Super-plasticizer (e.g. 0,5% by the Cement Weight).

Number Composition	The two – component (mixed) cement composition		Aqueous cement ratio, %	Aqueous solid ratio, %	The ultimate compressive strength, UCS, 672 hours
	Clinker cement, %	Carbonate filler, %			
1	100	0	21,75	21,75	100,0
2	88	12	22,65	19,78	104,0
3	78,5	21,5	25,85	20,25	90,0
4	64,5	35,5	33,15	21,39	84,0
5*	100	0	25,00	25,00	71,3

Note. The composition 5* – is the control one, it is corresponded to the normal density, and it is contained no «Glenium®51» additive.

Conclusions

The integrated application of the «Glenium®51» additive and the carbonate filler, in an amount of 12%, as the part of the self – compacting cement pastes, has been given the positive impact on the strength formation and the strength growth kinetics of the cement paste.

The carbonate filler application in the compositions of the self – compacting cement pastes is promoted the rational use of the local mineral resources and, moreover, the cost reduction of the construction.

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*Materials of Conferences***CHEMISTRY. A POCKET HANDBOOK.
GRADES 9–11**¹Doronkin V.N., ²Berezhnaya A.G.,²Sazhneva T.V., ¹Fevraleva V.A.¹Rostov State University of Railway Communications,
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The use of pocket handbook will help you prepare for the exam, university entrance and further education. The pocket guide contains a brief background material necessary for operative finding of important information and knowledge systematization. Handbook format allows you to use it in the classroom, at additional lessons in the process of independent preparation for tests and exams.

In an accessible form, the manual systematically provides information on the **general, inorganic and organic chemistry** at a level sufficient to successfully complete tasks of the state certification. The material is presented in the form of **reference notes, drawings, diagrams and equations of the reactions**, including basic principles of chemistry. Explanations are given using basic chemistry knowledge.

The handbook consists of three parts, namely general, inorganic and organic chemistry.

The **first part** – «General Chemistry» – covers the basic concepts of atomic structure and periodic table of chemical elements of Mendeleev, chemical bonding, redox transformations (redox

reactions, electrolysis, corrosion and corrosion protection), electrolytes and their properties (dissociation, ionic equations and hydrolysis), classification of chemical reactions and the general properties of oxides, bases, acids and salts. The **second part** of the book – «Inorganic Chemistry» – deals with the chemical properties of simple and complex substances. There are individual sections for methods for producing of inorganic substances, methods for the determination of certain substances and features that accompany chemical reactions. The material is consistently explained using the concepts of redox transformations and general properties of various classes of substances.

The **third part** – «Organic Chemistry» – presents the fundamentals of the theory of chemical structure, nomenclature and classification of organic substances, the basic information about the electronic structure of molecules and reaction mechanisms, methods of synthesis, as well as chemical properties of some classes of organic substances.

The publication is addressed primarily to students of grades 9–11. The handbook is part of «Chemistry. Preparing for the USE» educational complex.

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*Materials of Conferences***THE ECOLOGICALLY-ORIENTED
RECREATIONAL ACTIVITIES –
THE NEW DIRECTION IN CHILDREN
AND TEENAGERS EDUCATION**

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The rationale for the introduction necessity of environmentally-oriented recreational activities in the education of children and adolescents has been given in this paper. The teaching technologies experience in the environmental education, and the results of the research and experimental study have been presented in this paper.

The tourism and region conducting, local history, geography and culture, in the aspect of the ecological education of children and adolescents have already been given the great significance [1, 8, 9]. So, this challenge has, repeatedly, been raised up at the scientific, theoretical, and practical conferences of the different levels, as well as in the various scientific papers, articles, and publications [2, 4, 5]. The concept of «the ecologically-oriented recreational activities» (EORA) has already been formed, as a result of the research and experimental study and, as the author's understanding, it is consonant with the notion of «the ecologo-tourism activity», having interpreted, as: «the purposeful process of the formation of the ecological knowledge, skills, value orientations, norms of behavior in the natural environment, having based on the active tourist, local history, and regional activities and studies students» [3, p. 8]. So, in the further studies – the concept borders of «the ecologo-tourism activity» have already been defined, as the constituent part of the more capacious concept of «the ecologically – oriented recreational activities». This has been justified by the fact, that the recreational activities are practically included the tourism activity, which is usually extended not only to the environmental, but also in the social environment, i.e. in the social and natural environment [4, p. 145].

Thus, the quite new direction has already been formed in the ecological education of the children through the lesson of the special course «The Ecology, Tourism, Recreation» (e.g. the pilot and experimental studies 1997–2002, MOY COIII-27, Tyumen; 2002–2013, MAOY COIII-70, Tyumen) [5]. Here, the children, having engaged in the active forms of the recreation in the social and natural environment, have been formed the ecologically – oriented behavioral skills (e.g. the environmental competence): the movements in the natural environment, remediation, treatment with the wild animals, collateral wildlife and natural management side. Thus, at the optimal pedagogical technologies choosing: the continuity and succession ensuring of

the system in general and additional education – it can be the ecologically – oriented recreational activities of the junior schoolchildren and adolescents [7, pp. 30–31]. For all this, the environment competences are being formed at the young recreants [6].

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**ENVIRONMENTAL AND TECHNOLOGICAL
CHALLENGES OF INDUSTRIAL CITIES**

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State ecological monitoring of atmospheric air in populated areas of industrial regions of Russia, especially the territory of Eastern Siberia, reveals systematic exceedings of maximum permissible hygienic concentrations (MPC) of carcinogenic solution of the 1st class of hazard benzopyrene (BaP) in

cities with production of aluminium. At the example of the city of Shelekhov of Irkutsk region, where enterprise of electrolytic receiving of aluminum via technologies with self-burning anodes at the foun-

dition of stone coal coke-pitch compositions JSC «IrKAZ-SUAL» is located, significant (2–5 MPC) and high (over 5 MPC) degrees of pollution has been registered at almost all objects of biosphere (Table 1).

Table 1

BaP in urban ecosystem of the city of Shelekhov and its suburbs

	Mass concentration of bezapyrene			
Objects of environment	Minimum-maximum	background		MPC
(units of measurement)	(n is a number of samples)	Russia	region	
Atmospheric air, ng·m ⁻³	0,1–61 (<i>n</i> = 78)	0,1	< 0,01	1
Snow cover, ng·g ⁻¹	9–13550 (<i>n</i> = 20)	6–15	1–3	–
Soil of various purpose, ng·g ⁻¹	5,3–1300 (<i>n</i> = 100)	1–3 (15–20, black earth)	0,3 (grey forest)	20
Vegetation, ng·g ⁻¹	10–530 (<i>n</i> = 20)	1–5	7–15	1 (grain)
Surface water, ng·dm ⁻³	1–40 (<i>n</i> = 20)	0,1	< 0,1	5
Bottom depositions, ng·g ⁻¹	50–270 (<i>n</i> = 15)	1–3	0.6	20

The received results of condition of environment object represent carcinogenic hazard for natural ecosystems and human health, and it is necessary to allocate pollution sources in order to decrease or remove their negative impact com-

pletely. Therefore, balance of BaP in major sources of atmospheric pollution including productions of aluminium, construction materials, and also heating and transport system has been evaluated. The results are provided in Table 2.

Table 2

Contents and balance of BaP in sources of biosphere pollution on the territory of the city of Shelekhov

Production type	Discharge into atmosphere		Dumps into water reservoirs	
	t·year ⁻¹	contribution, %	ng·dm ⁻³	contribution, %
Sources of discharge				
Receipt of aluminium Electrolytic department	1,559	89,20	1135	97,2
Heat energetics Dust-coal boiling facilities	0,0003	0,02	3,2	0,3
Heating system Household stove	0,18	10,3	–	–
Construction industry Facilities of baking and receiving asphalt-concrete	0,0035	0,20	30	2,5
Automobile transport Gasoline and diesel engines of internal combustion	0,0052	0,28	–	–
TOTAL:	1,748	100	–	100

For all anthropogenic objects about 90% of total amount of BaP comes from discharges of sources of electrolytic department of aluminium plant. The existing technology if the most unfavourable one in ecological meaning, and it requires reorganization. Particularly, replacement of stone coal stoves with oil-based ones, self-burning anodes with already burnt type, implementation of efficient methods of cleaning gas-dust discharges, facilitation of circulation water supply will provide for a decrease in discharges of carcinogenic substances into environment.

The second biggest part in discharges of BaP into atmosphere refers to heat sources of heating systems – household stoves of private sector with facilitation of solid types of coal and wood fuel. Contribution of sources of industrial production, automobile transport, and heat sources of greater power has formed tenth and hundredth parts of total

substance mass. In case of sewer waters the greatest concentrations of BaP have been registered around production of aluminium.

Thus, high and significant, almost omnipresent pollution of natural environment objects of the studied urban ecosystem with carcinogenic BaP that exceeds background and hygienic levels, defines a great degree of ecological risk for the population and natural ecosystems of Southern Baikal area. These results testify for the presence of powerful sources of BaP discharge, and it requires new technologies of production and an efficient system of cleaning their discharges and dumps.

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*Materials of Conferences***KNOWLEDGE MANAGEMENT MODEL
BASED ON INTELLECTUAL
CAPITAL CONCEPT**

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Recognized feature of the modern economy is to increase the share of non-material components in the resulting products. This applies not only to high-tech industries, where the role of knowledge is obvious, on the preparation and use of which significant resources are left and that, in the end, give the value of the product.

In turn, this causes a need for models that allow to reveal the structure of intellectual resources of the region. On strengthening the evidence of this need, for example, that in the last decade, key international organizations such as the World Bank, UN, OECD are working in this direction. The concept of intellectual capital can be considered as one of the most promising models, revealing the structure of intellectual resources through the next set of categories [2].

1. Human capital.
2. Relational capital.
3. Process capital.

Renewing capital – intellectual regeneration system resources: educational and scientific – research institutions, their effectiveness and development.

The concept of intellectual capital covers the structure of the regional knowledge system which allows you to create a strategy for its development, and thus can be used as one approach to knowledge management in the region. In this connection it is useful to talk about the possibility of establishing a framework. Knowledge management is based on intellectual capital.

1. Preparatory stage. The purpose of this stage is to define the basic options for future work. First of all – problem solved in a particular study: development of recommendations for the further development of intellectual capital, its benchmarking, etc. The task requires special post evaluation of intellectual capital and the direction of the analysis of its results.

2. Monitoring parameters of the intellectual capital of the region, through the assessment of its elements and the level of their mutual influence can be carried out on the basis of indicators and by using expert methods.

3. Analyzing the status of intellectual capital. The purpose of this step is to create a vision of the current state of the intellectual capital of the region, for which the intellectual capital is the map that maps its elements in the coordinates of their condition and the level of influence, and use it to draw conclusions about the state of its structure.

4. Summing up is the final step which depends on the task set in the beginning. In general terms, it is expected to identify areas for further development of intellectual capital as a whole and its individual members in particular.

Among the basic principles on which the development strategy can be based intellectual capital of the region are the following:

1. The structure of intellectual capital must comply with the logic of the development of its media [3], i.e. the nature of the regional economy.
2. The region is a complex socio-economic system in which it is impossible to identify the «extra» elements [4] – the same can be said about the intellectual capital of the region.

Development of the intellectual capital of the region, therefore, is considered in the context of maneuvering between the development of its key elements, and the overall balance of the structure. This process can occur in three ways:

1. Orientation to the formation of distinctive features and elements of the priority development of intellectual capital is associated with the activities of the key sectors for the region.
2. Focusing on strengthening synergies due to uniform development of all elements of intellectual capital, which is reasonable in view of the complexity of many modern technologies and, as a consequence of failure to reach a result, developing only a narrow area of expertise.
3. In the situation where the structure of intellectual capital is unbalanced, we can talk about the need to eliminate these disparities, as the priority area of development.

Another important aspect should be mentioned: regardless of the chosen concept, it is essential to question the institutional mechanism for its implementation. The structure of participants of knowledge management in the region is similar to the participants in the formation of a regional innovation system (for example, within the concept of the «triple helix»), including the state, the business community and the scientific community, but the specific mechanisms of their interaction also require consideration.

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IMPROVING THE ORGANIZATION OF SAFE PRODUCTION THROUGH THE CREATION OF OCCUPATIONAL RISKS MANAGEMENT SYSTEM AT THE ENTERPRISE

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Systemic nature of urgent problems necessitates reforming the entire OSH management system, i.e. the system of preservation of life and health of workers in the workplace, taking into account the needs of development of Kazakhstan's economy and the ambitious tasks set by the Government of Kazakhstan aimed at achieving new quality of life and working conditions in Kazakhstan. The main objective of the program should be the protection of employees' health and safety of work by introducing a system of professional risk management in every workplace and involvement of the main parties of social partnership, namely employers and employees, in the management of these risks. Action program for improvement of labor protection and safe production should be aimed at achieving the following strategic objectives:

1. Reduced risk of occupational diseases and accidents at work.
2. Improving the quality of jobs and working conditions.
3. Reducing mortality from preventable causes.
4. Increased life expectancy and improvement of workers' health.

The main task of the new labor protection management system should be a shift from post factum reaction to insurance cases to managing the risk of damage to workers' health. This goal can be achieved by organizing a comprehensive, transparent professional risk management system, which should be the basis of the control system of preservation of life and health of workers during labor activity, covering all workplaces, regardless of their size and form of ownership. The concept of professional risk management system should be based on the fundamental principle: «the one who creates risks has more opportunities to manage them». A special role of occupational risks management system should be given to social partnership bodies, primarily organized by workers' representatives, such as unions, whose main task is the protection of social and labor rights, professional interests of employees, as well as activation of the human factor of social and labor relations. The state also should not remain on the sidelines. It is necessary to modernize the social security system. Implementation of activities related to the reform of social security system, including early (discounted) pension benefits of workers exposed to harmful production factors, will require special attention.

We need to establish a system of actuarial calculations, which will not only determine the size of differentiated insurance rate, providing real compensation of harm to the workers' health and their social protection, but also solve the problem of absence of the necessary statistical base and, as a consequence, imperfect information, analytical and methodological support of the obligatory social insurance against accidents at work and occupational diseases. We should create a new model of interaction between the government and the employer in financing the costs aimed at reducing the impact of harmful production factors. State guarantees will apply to compensation for harm of employees' health in the amount of legally defined limit tariff, calculated according to the approved methodology. The harm caused to the employee in the workplace can be fully compensated by attracting private insurance companies that can offer flexible schemes of insurance coverage based on separation of the economic responsibilities of parties. Thus, there will be established a system enabling the implementation of measures aimed at changing the set of factors of production environment and the labor process, affecting the performance and health of workers. Along with these measures for the development of social partnership for active and mass employees' involvement in the risk management process, it is necessary to strengthen the informational impact on public consciousness and systematically improve the work culture. Implementation of strategy should be organized through the «horizontal» line of power by building effective partnerships with major players in the professional risk management system. Tengizshevroil and the Government of Kazakhstan should monitor the effectiveness of the program through the appropriate indicators (target indicators) of regional, sectoral and corporate components – similar programs in the regions of Kazakhstan, sectors and the enterprises themselves at the appropriate levels of social partnership, provided by the Labor Code of the Republic of Kazakhstan. Thus, there will be allocation of responsibility of the key program participants and through (solid) character of introduction of professional risk management system in every workplace, and as a result – bringing the politics to the main objective, which serves as a strategic guidance of the program.

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DEVELOPMENT FINANCING AND ECONOMIC GROWTH NEXUS IN CASE OF KAZAKHSTAN

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This paper seeks the nature of the relationships between development financing and economic growth in case of Kazakhstan. The proposed research considers different levels study:

- a) industry level;
- b) regional level;
- c) intra-regional by industry level.

In this paper authors state the hypotheses, methods and data, which are appropriate for further investigation the following issues:

- 1) whether the development financing has a causal impact on economic growth in Kazakhstan at different levels;
- 2) what is the nature of these relationships;
- 3) is there a reverse causality effect in these relationships.

Thus, the main target of the present paper is to set up the key hypothesis based on existing theoretical, empirical and methodological findings in Finance and Growth study in order to analyze development financing and economic growth nexus in case of Kazakhstan as well as an impact of the Development Bank in these relationships. The future study could be instructive and complementary to the existing literature on finance-growth nexus.

Since the Kazakhstan has declared its independence and sovereignty the financial and industrial reforms has become the key aspects in its government policy. Kazakhstan has chosen its own way to the civilized market economy. In this light among other several important political reforms one of the main goal in stimulating economic development and sustainable welfare growth in Kazakhstan initially was the enhancing of the development financing.

By the external economic-geographical reasons, which root also into its soviet history, Kazakhstan has export-oriented economy (oil, gas, metals, grain, etc.) and that is why establishing the ample level of banking system as a finance addendum for local and international traders was carousal. This was on the one hand; on the other hand, there was a need in developing of the new sectors of economy such as producing industries and manufacturing in order to keep value added for domestic economy. The government has set the goal of moving away from the dependence on the exports of mineral resources by putting a stake on conducting radical economic reforms. Integration to the world economy and accelerated modernization of the national economy require a quality breakthrough in all development directions based on innovations, creating new sources of economic growth, and a better use of the traditional comparative advantages of the country.

According to these the establishing of the Development Bank of Kazakhstan (DBK) in 2001 and

its further strategic activities such as the long-run investment lending, export crediting and focus on processing industries financing has become a clear evidence of primary role of the regional development financing in facilitating economic growth and moving away from the dependence on the exports of mineral resources. Therefore, since the certain economic achievements in Kazakhstan, there is an expectation that finance development including both commercial as well as DBK's development financing are the key growth-driving factors in case of Kazakhstan. Thus the great opportunity is to consider and analyze the relationships between finance and economic growth, including the role of the DBK in these relationships and test this hypothesis empirically.

Besides, over the ten decades the issue concerning to the nature and direction of relationships between finance development and economic growth has been studied broadly and remain an important subject in literature. Different aspects of these relationships have been analyzed extensively in both theoretical and empirical studies for single-country and cross-nations as well as at industry and firm levels through cross-sectional, time-series and dynamic panel techniques.

That is why there is a need also to have a look at possible bi-directional causal effect, which might exists since oil, metal and other export-oriented mining industry have contributed significantly on Kazakhstan's GDP (around 60 %) due to substantial export supply from Kazakhstan. The future study could be instructive and complementary to the existing literature on finance-growth nexus.

Hence, the main purpose of the present paper is to set up the key hypothesis based on existing theoretical, empirical and methodological findings in Finance and Growth study as well as data availability from Kazakhstan statistic dataset.

Literature Review

Many of development banks failed, leading to large fiscal losses and poor development outcomes (Micco, Panizza, 2005). After the much-publicized failure of many national development banks in the 1970s and 1980s, the future of this type of development finance was in question. Poorly controlled spending by development banks and other state-owned banks delivered little in terms of development but contributed to fiscal crises in several developing countries (Nellis, 1986). Although the particular failures there have been visible successes: some development banks have maintained financial sustainability while adhering to their mandates. The successes of some banks and the continued need for the services they provide have rekindled interest in national development banks. This combination of successful development funding and insufficient private funding has led to re-examine of the potential role of development finance institutions (Siraj, 2004; Yaron, 2004; Nembessini-Silue, 2006). These raise an argument that, without a clear

understanding of the role of development banks, more failures could occur. They have provided counter-cyclical funding, facilitated access to credit, created employment, strengthened the capital market, built capacity in project appraisal and evaluation, and influenced government policies (Hulme & Mosley, 2002; Micco & Panizza, 2005). Thorn and Charlotte du Toit (2009) argue that despite the obvious need for a better understanding of their role, development banks have not featured strongly in the recent literature on development finance. Much of the relevant literature is either dated, deals with national development banks only in passing, or is restricted to particular aspects affecting their performance. In the most literature it is mentioned on the last available survey (Bruck, 2005) indicates that there are over 520 development banks worldwide. The success of the early development banks and the problems, which can contribute on their failure and why consider in De Aghion (1999). The primary requirements for development banks' successful performance and acting have pointed in Shirley (1989); De la Torre (2002) and Bruck (2005).

Hinds (2002) proposes the role for the regional development banks in the implementation of a modern worldwide financial. He assesses existing internal and external problems that are leading to a redesign of the worldwide financial architecture and proposes a role for these banks in their solution. The role of multilateral development banks assesses in Buitier and Fries (2002). Authors argue the role of these banks in fostering development or transition through the institutional mechanisms; they also conclude that a useful direction for these banks' reform is to exploit more effectively the potential complementarities between the public and private sector financing operations. The role of regional development banks consider in Griffith-Jones, Griffith-Jones and Hertova (2008). Authors conclude that there is a need for new or expanded regional development banks to fill gaps in the international financial architecture. Regional development banks have specific and localized roles which are not always covered adequately by global institutions. Toyoda (2006) examines the prominent role that development banks continue to play in the more advanced economies of East Asia through focusing on the role of such banks in Japan, Korea, and Singapore. Sobreiro (2009) discusses the special aspects of development banks and evidences that application of Basel II or even Basel finds serious obstacles and is not relevant because their operational logic, which is not the same as the private sector and nor are these institutions subject to the occurrence of systematic risk. Lazzarini and Musacchio (2011) look at the effects of equity purchases by Brazil's development bank on firm performance between 1995 and 2003.

There are certain papers which focus on regional, multilateral and bilateral development finance institutions (DFI), regarding to comparison

of their: aims and objectives; ownerships; general activities; distribution over sectors, countries; type of instruments; impact assessments; gaps and overlaps. (Kingombe, Massa and Dirk Willem te Velde, 2011). Dirck and Warner (2007) focus on the use of subsidies by certain regional, multilateral and bilateral development finance institutions in the private infrastructure sector and examine the nature and extent of subsidisation to private sector infrastructure in developing countries. The lending trends among multilateral finance institutions are shown in Humphrey and Michaelowa (2010). They investigate how country shareholding arrangements affect the lending of multilateral development banks under different economic conditions and over time. According to Kingombe, Massa, and Dirk (2011) the objectives of multilateral development finance institutions (DFIs) are often multiple, and may include investing in sustainable private sector projects; maximizing impacts on development; remaining financially viable in the long term; and mobilizing private sector capital. DFIs influence the economic growth directly as well as indirectly through attracting the Foreign Direct Investments.

In this light an impact of multilateral DFIs on economic growth in 150 countries is considered in Massa (2011). By using the Generalized Method of Moments (GMM) for panel data analyses, she studies the relationship between the investments of a selected sample of multilateral DFIs and economic growth for a sample of 101 countries in the period 1986-2009. While there is a rapidly growing literature assessing the effects of DFIs at the micro level, there are gaps in the evidence on the macro impact of DFIs' investments. For example, a number of DFIs have carried out specific evaluations to assess the results of their investment operations in terms of contributions to employment creation, technology transfers, market organization, capacity building, etc., and a few independent studies have tried to measure and assess the performance of DFIs. However, there is no study investigating the impact of DFIs on macroeconomic variables such as economic growth. The main task of Massa's paper (2011) is to fill this gap by analyzing the extent to which multilateral DFIs contribute to fostering economic growth. In order to do this, author takes into account different income categories of countries as well as different sectors in which multilateral DFIs operate. The adopted results show that investments by multilateral DFIs are growth enhancing and that their role is stronger in lower-income countries than in higher-income countries. It appears that lower-income countries benefit mainly from investments directed to the agriculture and infrastructure sectors, whereas in higher-income countries investments by DFIs in the infrastructure and industry sector play the predominant role in fostering economic growth.

Thus based on the most scholars' opinion and initial brief observation of the mentioned above literature it is evidently clear that it does not offer an

updated and comprehensive assessment of the role of the development banks. Therefore, this issue still in progress and needs to be investigate.

Hypothesis, Data and Variables

1. Sector level

There is an opinion that bank-based finance structure prevailed in developing countries and affects significantly economic growth in earlier stages of their economic development. According to theoretical background, since Kazakhstan economy is a development / transition economy, there is an expectations that the strong positive relationship between finance and growth exists in case of Kazakhstan. Based on substantial Growth-finance academic study, in particular at countries level we are motivated to apply different modern econometric techniques to check following issue: whether this theoretic-empirical point of view is evidently clear in case of Kazakh economy.

H1: Finance development (excluding/including DBK's loans) enhances sector value. Is there reverse causality effect?

The bank loans data, which is broken-down by the main sectors of Kazakh economy:

- 1) Agriculture.
- 2) Industry, including:
 - a) Mining;
 - b) Manufacturing;
 - c) Energy.
- 3) Construction.
- 4) Trade.

5) Transport and Communication are considered as a cross-sectional subunits.

The time dimension 2001–2011 is extended on a quarterly basis. Therefore, the time period is Q101–Q411. *Explanatory independent variables F*: are the bank loans, DBK's loans, total (Bank+DBK) loans extended to 8 economic sectors on quarterly basis. also can include Stock Market indexes as Market capitalisation and Volume traded (total and by sectors breakdown). *Dependent variables G*: value added to gross domestic product (GDP) by sector; quarterly basis deflated by appropriate Index (in real terms). Bank loans data at sectors level on a quarterly basis was found from NBK statistic bulletin beginning with 2001. The data for the industries' value added contribution to GDP (by the same industries as for the loans) have taken from NSA bulletin as a measure for economic growth. The loans dates as well as GDP at industry level dates are represented at the end of each quarter Q101–Q411 in local currency, so that we have needed to deflate them by using appropriate index.

2. Regional level

In order to be able to provide fully comprehensive analysis, use any possible perspectives based on recent approaches and different econometric estimations we have decided to have a look at horizontal (regional) level of the development in addition to vertical (industry) level. It is necessary to note that from the very beginning DBK has paid

substantial attention to the regional lending diversification in its credit policy since the 16 local regional governments have become the shareholders of DBK. That is why DBK provide accurate monitoring of its regional lending statistic in its reports. These all could allow us to construct integrated view for the finance development relationships in Kazakhstan and consider the DBK's contribution to the regional finance development and as a result to the regional economic growth, which is crucial part of the national economic growth.

H2: The DBK's Role in Regional Finance Development

The bank loans data, which is broken-down by 16 official regions – «oblast» (districts) of Kazakhstan are considered as a cross-sectional subunits. The time dimension 2001–2011 is extended on a quarterly basis. Therefore, the time period is Q101–Q411. *Explanatory independent variables F*: are the bank loans, DBK's loans, Total (Bank + DBK) loans extended by 16 regions in Kazakhstan on a quarterly basis. *Dependent variables G*: gross regional product (GRP) on a quarterly basis deflated by appropriate Index. The NBK and NSA statistics offers the appropriate data on a quarterly basis at regional level (16 regions) on a quarterly basis for Q101–Q411. In particular, the regional breakdown of the GDP represents NSA databases (in PDF format) in present prices and need to be deflated. NBK offer in its bulletin the bank loans data at regional level, which is represented at the end of the quarter and in local currency so that also need to be deflated. We have found some regional data for DBK's loans from its website just on an annual basis. Hence we still need to find DBK's data for every our chosen time intervals and regions. We are attempting to construct strong empirical evidence for the stated above hypothesis by using several econometric approaches, which are more appropriate in case of Kazakhstan from data availability point of view. Besides the main purpose of research is to have a look on DBK's contribution among whole banking system in Kazakhstan and find empirically its crucial role in ameliorating economic growth.

Model Specification and Methodology

In the modern econometrics of finance and growth the main types of empirical research from the data collecting point of view might be divided by the following groups: cross-sectional data analysis (data is collected in the particular or closest time period); time series data analysis (several observation of the definite data that collected during the definite time intervals); panel data analysis (generalization of the first – cross-sectional and the second – time series analysis); pooled cross sectional data analysis (different cross-sectional data that aggregated in different time periods). The most applied method for the economic and growth study is the construction and estimation of the simple regression model:

$$G_{it} = Y_{it} - Y_{it-1} = \alpha + \beta_i F_{it} + C_{it} \gamma_i + \mu_i + \varepsilon_{it} \quad (1)$$

where Y is per capita (log per capita) real GDP or of the another measure of welfare, such as real capital stock or measure of total factor productivity, G is the growth rate of Y , F is one of the measure of the financial sector development. C is a standard set of conditioning information, is the observation unit as a country, t is the time period. μ and ε are error terms. While ε is a white noise error with a mean of zero, μ is a country-specific element of the error term that does not necessarily have a mean of zero. The explanatory variables F and C are measured either as an average over the sample period or as an initial value. Since the disaggregated data on industries or firms levels have become available the observation unit i in regression (1) could be an industry, a firm or a household.

Thereby the main problem here is to determine a sign and significance of the coefficient β_p , and to check whether the estimate of β_i is unbiased and efficient. In other words to define whether the explanatory variables' in (1) are endogenous variables and if so to identify what are the possible reasons of these and use particular techniques to eliminate endogeneity bias.

1. Sector level

In order to explore our Hypothesis **H1** we consider following panel regression model

$$G_{it} = Y_{it} - Y_{it-1} = \alpha_1 + \beta_1 F_{it} + C_{it} \gamma_1 + \varepsilon_{it}; \quad (2)$$

$$F_{it} = \alpha_2 + \beta_2 Z_{it} + C_{it} \gamma_2 + v_{it}; \quad (3)$$

$$F_{it}^* = F_{it} + u_{it}, \quad (4)$$

where $i = 1, \dots, 8$ indicate sectors; $t = 1, \dots, 44$ indicate quarters; G_{it} is dependent variables and indicate value added to GDP by i the sector at quarter t (deflated

by appropriate index); F_{it} is independent variables and indicate bank loans in i the industry including/excluding DBK's loans; Stock Market indexes as Market capitalisation and Volume traded (total and by sectors breakdown) at quarter t . C and Z included and excluded exogenous variables, respectively. Z are not correlated with error ε : $E[Z_i' \varepsilon_i] = 0$ and $E[Z_i' u_i] = 0$.

Estimating regression (1) with instruments (IV) can help alleviate biases arising from reverse causation, omitted variable and measurement error. Regression (1) is typically estimated with a Two-Stage-Least Squares Estimator (TSLS). Unlike the OLS estimator, the TSLS estimator only uses the variation in the explanatory variables that is correlated with the instrument and therefore uses less information than the OLS estimator. If OLS is consistent, it is therefore more efficient than IV, whereas if OLS is inconsistent, the IV estimator is both consistent and efficient.

Rajan and Zingales (1998) seek to establish the impact of financial development on industry-specific growth for 41 countries and different manufacturing industries in 1980–1990. Their study involves a cross-country and cross-industry consideration. They have estimate a multiple regression model, which specified economic growth as the dependent variable. As a proxy for growth, the average annual real growth rate of value-added has been used. Two finance indicators; in particular the capitalization ratio and accounting standards were used as a proxy for finance development indicators. The study asserts that financial development enhances growth in indirect ways. In Rajan and Zingales (1998) own words the model they estimate is:

$$\begin{aligned} Growth_{j,k} = & \text{constant} + \beta_{1 \dots m} \times \text{Country Indicators} + \beta_{m+1 \dots n} \times \text{Industry Indicators} \beta_{(n+1)} \times \\ & \times (\text{Industry 's share of manufacturing in country k in 1980}) + \beta_{(n+2)} \times \\ & \times (\text{External Dependence of industry j} \times \text{Financial Development of country k}) + \varepsilon_{j,k} \end{aligned} \quad (5)$$

According to Rajan and Zingales (1998) appropriate measure of an industry being "better off" is the growth in value added for the industry, i.e., the change in the log of real value added in that industry between 1980 and 1990. Real value added in 1990 is obtained by deflating value added by the Producer Price Index and/or Index of industrial Production and/or Wholesale Price Index (which data is available). For the finance development measurement, the ratio of domestic credit plus market capitalization to GDP (Capitalization ratio) has used. For checking the robustness test the capitalization ratio has been also redefine as the ratio of domestic credit to the private sector to GDP. As the second proxy for finance development, they have used the accounting standards in a country. The primary hypothesis was, «industries that are more dependent on external financing will have relatively higher growth rates in countries that have more developed finan-

cial market». The study designed a multiple regression model, which specified growth as the dependent variable and the financial development, external finance dependency, country specific factors, and industry-specific factors. The average annual real growth rate of value-added was used as a proxy for growth, while value-added and gross-fixed capital formation for each industry obtained from the Industries Statistics Year Book (1993). Two finance indicators were used as a proxy. These are capitalization ratio and accounting standards. The study asserts that financial development enhances growth in indirect ways.

2. Regional level

Since we are attempting to consider Development and Growth relationships in line of endogeneity problem, our time detention horizon and cross-regional data allow us to analyse Hypothesis **H2** using TSLS approach as well as try to apply

dynamic panel regression approach. Therefore, our panel regression is as follows

$$G_{it} = Y_{it} - Y_{it-1} = \alpha_1 + \beta_1 F_{it} + C_{it} \gamma_1 + \varepsilon_{it}; \quad (6)$$

$$F_{it} = \alpha_2 + \beta_2 Z_{it} + C_{it} \gamma_2 + v_{it}; \quad (7)$$

$$F_{it}^* = F_{it} + u_{it}, \quad (8)$$

where $i = 1, \dots, 16$ indicate regions; $t = 1, \dots, 44$ indicate quarters; G_{it} is dependent variables and indicate regional growth in i the region at quarter t (deflated by appropriate index); F_{it} is independent explanatory variables and indicate regional bank loans including/excluding DBK's loans in the region at quarter t . C and Z included and excluded exogenous variables, respectively. Z are not correlated with error ε : $E[Z_i' \varepsilon_i] = 0$ and $E[Z_i' u_i] = 0$. Appropriate data availability from Kazakh sources and rich econometric techniques encouraging us to expect that modern empirical approach is applicable for exploring our second hypothesis **H2** and computes significant results, which could contribute in Growth-Finance study.

Conclusion

There are certain econometric instruments, which have been applied by scholars in their research to explore and describe existing economical processes on the macro and micro levels based on the relevant statistical data. Over the ten decades the issue concerning to describe properly the relationships between finance development and economic development has studied broadly using different econometrical approaches. These offer certain comprehensive methods showing how is it possible manipulate with data and statistic in order to find new interpretations or generalized the already existence theory. Moreover the substantial development of data accessibility on the international as well as country, industry, firm, household levels encourage for further more deep and detailed investigation, which could help contribute in this particular area. All of these allow us fully consider and analyse the finance and growth relationships and have a look at possible bi-directional causal effect, which could exists due to the substantial export supply from Kazakhstan.

Thus the hypothesis whether the Development Financing and Economic Growth in the transition economy of Kazakhstan have causal effect is an issue for further proposed investigation.

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THE MARKET EFFICIENT FUNCTIONING ORGANIZATION IN VEGETABLE GROWING PRODUCTION

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In the world practice, the various organizational and legal forms of the agricultural enterprises are being used, which are usually determined by the national legislations. The laws are given them the necessary status of the legal entity, having possessed the separate assets and its property, as well as it is met, by its obligations, with this property, having had its own balance sheet. When choosing one or another organizational and legal form for the vegetable – growing enterprise, it should be taken into account its possible formation conditions, i.e. its own funds presence or absence for the efficient conduct of the production proceedings, the employees' stock purchase management, the motivational incentives of the production further development, the democratic governance, the integration and linkages between the quite different enterprises, businesses and industries.

There are several basic options for the purposes of the market efficient functioning organization:

- to be achieved the highest possible consumption of the manufactured goods;
- to be achieved the maximum consumer satisfaction;
- to be provided the widest possible products' choice [1; 2].

At the first option targeting choice, it is quite advisable to be paid basic attention to the advertising and marketing services, and then, the whole marketing system will be matched the selected target. So, such goal orientation is quite characterized for the monopoly enterprises, or the manufactured goods are the goods of the prime necessity. At the second option targeting choice, it is necessary not to be improved the advertising and marketing services, but also to be made the necessary adjustments in the production, in order to be increased the customer value, in accordance with the demand. When choosing the third option of targeting, except the advertising and marketing services, the customer value enhancing of the goods, it is quite necessary to be provided the development management of the new goods. On what goal orientation will be selected now, the marketing service structure will be depended, which should be ensured all planned activities fulfillment on the marketing.

So, the Marketing concept is practically considered the most efficient, at which the vegetable – growing enterprise is always focused on the client, moreover, all the functional departments of the enterprise are working together, for the purpose of the best servicing and the customer demands satisfaction. Thus, having taken into consideration all the possible differences in the volumes of the manu-

factured production, as well as in the markets, that are catered to the vegetable – growing industries enterprise, the second and the third options targeting will be the best suited, that is «to be achieved the maximum customer satisfaction», or «the widest possible choice of the goods» [2; 3].

The service of the market efficient functioning organization in the vegetable – growing production is the link between the vegetable – growing enterprise and the customers, both as in the local market, well as its beyond:

- develops the aspects to study the Demand and the market analysis for the particular type of the vegetable production and together with the trade employees studies population consumer demand for these products;
- produces surveys of the commerce enterprises, both, as in the region, well as its beyond;
- draws up and prepares the reports on the market research and submits them to the enterprises concerned;
- participates in the fairs, and the wholesale markets, studies the demand, and signs the agreement with the enterprises, the associations, and the firms of the wholesale and retail trade;
- studies the demand production of the vegetable – growing production at each enterprise;
- examines the vegetable–growing production stocks structure in the agribusiness warehouses and provides their sales on the favorable terms;
- studies the production wastes structure and organizes their sale for the cattle fodder and for the other purposes;
- explores the provision issues of the vegetable – growing enterprises with the necessary equipment and the other means of production [3; 4].

Thus, the adherence to the scientific and substantiation technology of the vegetable –growing cultures cultivation, and the other organizational–economic and technological measures will be allowed more efficiently to be used the resource potential of the agrarian production and, first of all, the agricultural production. As a result, the vegetable – growing cultures crops yield will be increased, the amount of the acreage areas under the crops, and the production of the high quality, the competitive vegetable – growing products, as in the domestic, well as in the foreign markets will be also increased.

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KAZAKHSTAN'S NATIONAL INNOVATION SYSTEM: KEY ELEMENTS AND THE MECHANISM OF DEVELOPMENT

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One of the main conditions for the successful development of state economy is the formation of a national innovation system (NIS), which should ensure the continuous growth of economy. Development of the national innovation system of the Republic of Kazakhstan is aimed at achieving sustainable development through economic diversification and abandonment of its raw material orientation, while innovations are defined as the main factor determining the competitiveness of the national economy. National innovation system includes four main elements, namely the scientific potential, innovative entrepreneurship, innovation and financial infrastructure. For the formation of NIS, there are 4 major subsystems, in which the state can effectively implement innovation policy through direct or indirect participation:

1. *Scientific and technical potential* is a foundation for innovation development. Scientific potential includes public research organizations, scientific organizations with national companies, private scientific research institutions, scientific personnel, and material and technical research base.

2. *Innovative business activity* is the main driving force for sustainable economic growth. *Innovative* business environment that includes various categories of natural and legal persons willing to participate in the management and financing of potentially highly risky and highly profitable projects, as well as invest in conducting prospective applied research and experimental development, commercialization of which may lead to the creation of new competitive products. In particular, the following can be referred to the field of innovative entrepreneurship: private investors and managers of innovation projects, business angels, innovative enterprises, funders of promising applied research and development, as well as venture capital funds. The latter should act not only as passive sources of innovative project funding, but also independently engage in an active search and promotion of promising developments in the scientific research field.

3. *Innovation infrastructure* is a set of interrelated production, consulting, educational and informational structures ready to provide a framework and a range of related services for the organization of innovative industries. Innovation infrastructure is a complex of enterprises, which include material and technical base, trained professional staff and established mechanisms of cooperation with academic and financial institutions, necessary for the provision of complete package of services for

organizing innovative productions for innovative entrepreneurs, ranging from consulting, initial market research and writing business plans, to the provision of preferential rent for premises, production facilities, utilities, etc.

4. *Financial infrastructure* is a complex financing, scientific, industrial and educational processes in the field of innovation and technological development. Based on public-private partnership, this infrastructure is ready to participate in the financing of high-risk innovative projects. In addition, the financial infrastructure provides comprehensive financing of perspective applied research and development activities, as well as stimulates the development of entrepreneurship in the innovation sphere and infrastructure through the direct and indirect mechanisms.

Since independence, Kazakhstan's economy had undergone major changes that have led to economic growth. Adoption of the Strategy of Industrial and Innovation Development was an incitement to the next stage of reforming the economy. The Strategy of Industrial and Innovation Development can be divided into three stages: the first stage – 2003–2005, the second stage – 2006–2010 and the third stage – 2011–2015. At present, our country is developing a state program of forced industrial and innovation development for 2010–2014. It is done in order to ensure diversification and competitiveness of Kazakhstan's economy. The program involves modernization and diversification of the economy basic sectors over the long term. Priority directions of economic development are agriculture, oil refining, metallurgy, chemical industry and pharmaceuticals, energy, engineering, transport and telecommunication infrastructure, etc.

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POVERTY AS AN ECONOMIC PHENOMENON AND POSSIBLE WAYS OF REDUCING IT IN KAZAKHSTAN

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As a phenomenon that accompanies every economic system, poverty has always existed in all countries regardless of their level of development.

Poverty affects not only the level of people's lives, but also the social and political spheres of life, becoming the source of rising crime and social conflict in many cases. As a consequence, the world community faces the task of poverty reduction.

Reduction of poverty in the society can be achieved through the creation of conditions for country development as a whole, as well as for the realization of potential opportunities of each person. In other words, in order to overcome the problem of poverty, it is necessary to provide a number of conditions, namely sustainable economic growth, expansion of opportunities for productive employment of population, the effectiveness of social policy, rational state regulation and the development of democratic institutions in society. Developing and implementing national strategies for poverty reduction in Kazakhstan, primarily taking into account the interests of poor people, is an important step in achieving the goal of reducing poverty in the world.

In the broadest sense, poverty is understood as socio-economic status of households or a person, in which their (his/her) relatively low level of cash, property and other resources do not allow to meet their (his/her) natural physiological, physical and spiritual needs.

According to the legislation of the Republic of Kazakhstan, living wage is a necessary minimum cash income per person equal in value to the minimum consumer basket and providing person with satisfaction of minimal needs at the level adopted by the society at this stage.

Processes of transition to the market in the Republic were accompanied by phenomena such as stopping and closing of several state-owned enterprises, and, as a result of this, a serious scale of unemployment. Lack of work was one of the main causes of poverty in Kazakhstan. The problem of unemployment became particularly acute in rural areas.

The social sphere, including health, education, science and culture, has been seriously affected in the last two decades. Socio-economic difficulties of the transition period contributed to the decline of income for most of the population of Kazakhstan. Thus, the average per capita income of more than 62% of the population in 1997–1998 was below 3,000 tenge per month. During those years, fourth of the population had a per capita income 3,001–6,000 tenge per month (less than \$ 70). It is only in 1999 and 2000 that real incomes of the population began to grow on average by 4–5%.

At the time, the state and society came to the implementation of purposeful activities to combat poverty, and the reduction of unemployment through active employment policy and targeted social assistance to the poor was of the highest priority. Cooperation with international organizations, such as the IMF (International Monetary Fund), World Bank (International Bank for Reconstruction and Development), the UN (United Nations)

and others goes to a new level in the implementation of various social programs, as well as attracting major investors to the country in order to develop the economy sectors. Thus, the level of poverty in Kazakhstan amounted to 3,8% in 2012 and 2013, versus 5,3% in 2011.

Definition of specific tasks and policy priorities for the fight against poverty at each stage of the current situation is an important moment in the process of combating poverty. For Kazakhstan, the priority directions of this strategy are the following:

- Ensuring sustainable economic growth. At the same time, macroeconomic policies should be maximally focused on support of the poor, solving the problems of inequality and providing maximum opportunities for the poor.

- Poverty should be considered as a complex multidimensional phenomenon, which will require concerted efforts by all partners working in the field of development (government at central and local levels, business sector, academic and research institutions, NGOs (Non-governmental organizations) and other civil society groups, international organizations, the media and the people themselves).

- The fight against unemployment. In order to increase the effectiveness of measures aimed at reduction of unemployment level, it is necessary to improve the regulatory framework in the field of labor market, take measures to legalize labor relations, stimulate the flow of labor from the scope of «hidden» employment to a fixed labor market, and improve the economic mechanisms for the protection of domestic labor market.

- Development of small business.
- State support for small and medium businesses.

- Development of micro-credit programs.
- Development of regional plans to combat poverty.

- Further democratization of society.
- Development of the Kazakh village.
- Ensuring the accessibility of education, health and environmental concerns.

- Improving the efficiency of funding for programs against poverty.

- Improving the monitoring mechanism for poverty reduction.

The most important element of this strategy is broad-based economic growth that provides new jobs and higher income.

Another component of poverty reduction strategy is the creation of conditions for poor people, which would allow them to take advantage of opportunities for employment and income generation.

The task of reforming the education and health systems is relevant; today's students would gain skills necessary for the existence under changing demand of the market economy, and the population would be provided with quality health services, financially accessible both to households and the state.

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**THE CORPORATE SOCIAL
RESPONSIBILITY, AS A PART
OF THE MODERN FIRM
CORPORATE CULTURE**

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The profit maximization is the classical objective of the commercial organization activities, but, recently, the ethical component of the business conducting has been given more and more attention. The ideas of the necessity of the moral and ethical values and the corporate social responsibility, as the basis of the long – term stability of the economic subjects, are the worldwide tendency. So, the modern business ethics principles are based on the informal social contract between the firm and the society, concerning the common norms of the behavior. The social business responsibility, having implied, that the company is being strove to be satisfied its own needs, its partners' and the whole society's needs, as well as to be minimized all the negative consequences of its activities, have already been included, in particular, in the given contract.

Even in the ancient times, the corporatism sense had already been led to the relevant internal norms, rules, and regulations formation, which, in their turn, that were strictly adhered to and, subsequently, they were transformed into the corporate values and the principles, which, necessarily, had to be separated and to be taken by those, who wanted to become the member of the corporate association [2]. Then, in the Middle Ages, such corporate norms, rules, and regulations have been existed in the quite different and various occupational groups: students, artisans, craftsmen, and merchants. So, in Russia, the corporatism ideology has been evidently revealed for the majority of the nobility, and later, at the merchants, entrepreneurs and business class, having combined in the quite different and various, and, consequently, the quite different and various statuses of the guild. The merchants guilds, the artisans and craftsmen shops, along with the technological secrets of their trade, had had the certain «codes of the honor», the work ethics, that were passed down from the father to the son and the violation of which had been led to the exclusion from the shop (e.g. guild).

In the recent decades, the significant cultural impact on the economic activities of the person has,

increasingly, been recognized by the economists. This has not been in the mainstream areas of the economic theory. So, the economy has been studied, as the joint activities of the people, as the social reproduction, during which the objective relations are emerged between its participants, that are, primarily, depended on the development level of the production material conditions, in the traditional political economy. The economic entities and the subjects' behavior have been considered, as due being conditioned to their place and the role in the social production, which is the dominant type of the social and economic appropriation.

Thus, in «the mainstream» of the modern economic theory, having presented by the economics, the presentation on the man is the fundamental idea, as «the homo economicus» – «the economic man», the rational subject, having made the economic decisions on the basis of the individual interest absolutism. But the economic behavior motivation of the subject of the subject, is conditioned due not only his to his personal economic interest, but also the general social and economic conditions, the institutional environment, the spiritual, moral, and cultural his settings of the selected, as the member of the society. «Being motivated, as the purposeful ones, and, having the real choice possibility, the people, at the same time, are, practically, being formed by the surrounding their cultural and institutional environment» [4, 118–119].

The institutional theory is being extended the frameworks of the economic analysis by the effect study of the non – economic factors on the economic processes. The elements of the state and legal system, having insured the specification and the property rights protection, the social norms, the traditions, and the cultural peculiarities have been considered, as these factors. So, the economic organization has been considered, as the social Institute, which is concentrated in itself the certain order, which is given by the individual organizational structure, the existing legislation, and the external Institutes. Some stable regulations and the patterns, which are formed the firm's culture, and are made its influence on the interpersonal relations, and, subsequently, on the resolved solutions, are being acted inside this system.

At the *firm's culture* determination, the researchers have been cited, most often, for the behavior and the value orientation patterns, which are adhered the company's staff members just in their actions. Having used the terminology, being adopted in the Institutionalism, it can be defined it by us, as *the informal rules* set (e.g. having not recorded in the laws and the contracts), *the semi – formal rules* (e.g. having fixed only in the internal documents and the codes), and, *partly, the formal rules* (e.g. having included in the laws and the contracts), which are reflected the firm's participations collective presentation (e.g. the principals and the agents, or the agents coalitions) on their interaction, behavior, and the firm's appearance.

Thus, the following main advantages, having achieved by the firms and companies with their high level cultural development have been identified and then, summarized on the basis of the scientific sources analysis: the company's stability is being increased, in the case of the external environment deterioration; the transaction costs are being reduced; the economy is being generated on the cost savings management, as the formal structure of the organization is simplified; favorable conditions are being created for the improving of the human capital quality; the sense of belonging and identity with the company is being developed at its workers, which is increased their incentives to the labor activities; the relationships stability of the principals and the agents is being enhanced, as the company's members, the social partnership is being strengthened; the inconsistency is being eliminated in the actions of the employees, resulting in the greater productivity is increased; the quality of the labor and the products is being increased; the unique look of the company is being created, which is the significant factor in the non – price competition in the markets, the quite serious competitive advantage of the firm. So, the culture has been becoming the quite significant feature and the specific asset of the efficient firm [1].

The modern business ethics [3] is implied the certain entrepreneur's behavior, at which, to the same extent, the interests are respected of both, as his own company, well as its partners, clients and customers, and society, as a whole. The ethics norms are aimed at the benefits obtaining of the economic agents by the maximum number, while any harm infliction is completely excluded: the violation of the proper rights; the assignment of the classified information (e.g. insiderization); the misleading advertizing; the freedom infringement of the consumer choice; the commercial espionage. Besides all these ethical considerations, these standards implementation in the Russian business community and the world economy has been explained, due to the fact, that all these enumerated manifestations of the opportunistic behavior, ultimately, will be led to the economy destruction, and, moreover, the risks and the transaction costs will be raised.

According to the classical definition of the European Commission, the Corporate Social Responsibility (CSR) – is the concept, that is reflected the voluntary solution of the companies to be participated in the society life improvement and the environmental protection. The companies, having adhered to the framework of its corporate culture of the social responsibility policy, should be aware of their responsibility: to the customers and the partners – for the quality of the provided services and the complete disclosure of the information; towards its employees – for the provision of the favorable working conditions, and, as far as possible, the opportunities for the occupational growth; to the society – for the implementation of the social, charitable, and environmental natural conservation projects.

The globalization process is brought also the Russian companies and firms to the necessity comprehension to be complied and observed the international standards of the corporate governance and the esthetic standards of the modern business conducting. So, the growing ethical requirements and the motives are the core, of the so – called corporate social responsibility ideology. Thus, the business ethics further improvement and the corporate social responsibility expansion are contributed to the negative attitude changing of the public, investors, and consumers to the big business, what is in dire and the Russian companies are needed.

As it has already been noted above, the corporate culture further improvement the economy management under the contemporary conditions is one of the tools to be enhanced the functioning efficiency of the modern company. Thus, the main task of each modern Russian company – is to be found their own culture, to be found its face, and the social responsibility must be become the significant part of the corporate culture of the modern firm. All the members of company's team should be involved, as much as possible, for the maximum positive effect achievement from the CSR principles introduction in the company's corporate culture, to the social programs' further development and their successful implementation.

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METHODS OF GOVERNMENTAL REGULATION OF ENTERPRISING ACTIVITIES

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The government performs its regulating functions through administrative and economic methods. Administrative methods of regulation are common for team economy. However, governmental regulations on market economy are based on economic methods. Administrative or straight methods limit the choice of economic entity. For instance,

policy targets on volume and range of produced products or centrally fixed prices for goods and services, typical methods of administrative regulation in economy planning, deprive the usage of alternative resources for the entity [1]. Unlikely, economic and indirect methods of governmental regulation do not limit the entrepreneurial freedom of choice. For example, decreasing the taxes on business or lowering the discount rate are the common examples of economic regulation, directed to increasing the production and strengthening investing activities of entities. The latter increase investing in capital and volume of production not due to lack of choice. They have the total freedom of choosing production program and investing policy. Lowering the taxes and discount rates increases the speed of growth in production and investments more beneficial than before. At the same time, by forcing entities to perform specific actions, any administrative controls have secondary indirect impact on a range of related economic processes. For example, administrative price increases not only determines their level, it also indirectly determines the demand and supply level, and by this it can be stated that any methods of administrative control have the characteristics of any indirect economic controls. Administrative control methods are diametrically opposed to the nature of the market, they block the action of the relevant market regulators. If the volume of production and supply of raw materials dimensions are defined for the enterprise, it can not respond to changing market conditions by increasing or reducing output. The higher incidence of administrative management techniques, the narrower the scope and lower the efficiency of the real market relations.

Economic methods of regulation, by contrast, are adequate to the nature of the market. They directly affect the state of the market and by that indirectly affect the producers and consumers of goods and services. For example, an increase in transfer payments changes the conditions in market for consumer goods also increases the demand, which in turn contributes to higher prices and forcing producers to increase supply volume. Thus, economic management methods operate over the market through market mechanisms. Transition from a command to a market economy is accompanied by dramatic changes in the system of state regulation methods, destruction of the previous system of administrative methods and the creation of a new system of economic regulators. In order to reduce the scale of the crisis production drops and to prevent a catastrophic drop in living standards, the state may maintain, in the early stages of reform, administrative control over the production and sale of a small group of products that form the basis of production and personal consumption of the nation. With the deepening of market reforms, economic stabilization and mastering economic methods the state completely reduces the scope in usage of administrative levers, without giving all the way their use.

In Kazakhstan, as well as in other post-communist countries, we face the underestimation of the government role in the economy. Misunderstanding the economic role of the state prevents developing a suitable concept of state economic policy. It is not a secret that the reforms are carried out «from above», and this is no tragedy that it is the only acceptable form. Kazakhstan's economy is experiencing an unprecedented crisis in the history where all economic «diseases» have intertwined. Since the crisis has objective reasons, any post socialist country has not escaped it. Somewhere it is less, somewhere it is deeper than in our country. The role of business is constantly growing steadily in our country. Entrepreneurship is intended to address important issues in today's economy, such as:

- to expand production of many consumer goods and services significantly and without significant capital investments, using local sources of raw materials;
- To create conditions for the employment of labor, liberated in large enterprises ;
- To make a positive alternative to criminal business, and many others.

State provides support for business in the following areas:

- The creation of favorable conditions for the use of state financial, statistical, logistical and information resources for the business entities, as well as scientific and technical developments and technologies;
- Establishment of a simplified procedure for state registration of business entities, their licensing activities, certification of their products;
- Elimination of the legal regime favored for businesses, including the preferential tax treatment, payment of customs duties;
- Establishing a system to attract and use of investments, including foreign, to support the development of entrepreneurship;
- The adoption of special lending programs of businesses to the definition of financial resources;
- Establishment of a simplified procedure for state registration of business entities, their licensing activities, certification of their products;
- Support for foreign economic activities of businesses, including the development of their trade, scientific, technical, industrial and other relations with foreign partners.

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THE FOREIGN EXPERIENCE FEATURES OF LABOUR MARKET STATE REGULATION

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At the present stage, the state regulation of the labor market has already become one of the most priority directions of the state policy of the social further development, the center of which is the human being, in the Republic of Kazakhstan.

So, the successful further development of the economy is quite impossible without the civilized labor market functioning. It is associated with the profound changes in the social and labor relations system, having affecting the interests of all their constituents and the subjects of the state. The commenced labor market formation process is, largely, escalated the challenges in the employment sphere, under the crisis conditions: the employees' number reducing, the negative phenomena increase, having connected with the unemployment, the real salaries and wages falling, the social tensions increasing. So, this is practically reinforced the need for the state regulation of the labor market, as the necessary and emergency measure, on the way out of the existing crisis, objectively is determined the labor market regulation further improvement, and the constant search for the quite new approaches to the domestic labor market management. Thus, all this has been made us to be turned to the study of the foreign experience of the labor market regulation, and also its adaptation to the system of the state regulation of the home and domestic labor market [1].

Today, the constant market pressure is became especially hard, that it is led to the expansion of the number of the functions and the tasks, that are practically covered by the state, which, in its turn, is led to the transition from the periodic labor market regulation on the industrial stage to the system management by the qualitative and quantitative characteristics development of the working force (e.g. vocational – qualified and educational ones) to the post-industrial stage of the economic development, which has already been implemented by many developed countries [2].

For the unemployment challenges successful solution, its negative economic and the social consequences overcoming, it is quite necessary the state's and the government's specific measures to be combated with unemployment, and they, moreover, should be confirmed and supported by the appropriate fiscal and credit policy, having stimulated and enabled the quite new working places and jobs creation at the enterprises of the various forms of the ownership, through the full and partial costs compensation of the hiring and working force training, the subsidized loans allocation for the working places and jobs creation, as it is in the developed countries. So, for example, in the USA, the domestic and home corporations are received the tax credit of 4,5 thousand

dollars a year during the biennium period of time for each recruited for the employment program.

In Germany, the state and the government subsidy is being introduced for the further engaging in the gainful employment. So, the various types of the organizational and financial support to the unemployed involvement into the labor market activity are covered, with this special grant (e.g. Eingliederungszuschuss, EGZ). The size and the duration of this provision grants accepted the unemployed for his employment, in principle, is determined by the results volume of his work and the requirements for the relevant workplace. Thus, the amount of the subsidy can be made up 50% of his labor earnings, and it can be provided for the term up to 12 months.

Also, the payments are made to be engaged the self – employed persons in the labor career. Already, the existing, on this score, guidance is complemented by the opportunity to be got the state financial assistance by these persons for the counseling and the mediation, from the side of the competent third parties.

At the same time, the subsidies (Zuschüsse) are being introduced to the employer, as the labor relations promotion. We are talking on the subsidies to the employer, when he is taken them to be worked for the long – term period the unemployed persons, having received the social benefits, as well as the persons, who have the quite serious difficulties in the finding their work. The subsidy to the employee is made up to 75% to their earnings, depending on their individual employment outcomes, and it, moreover, can be provided in the temporary period of five years (e.g. 60 months) maximum during two years (e.g. 24 months) [3].

So, the special attention is given to the German trade unions activity. One of their peculiarities and the special features is, that there is no the primary trade union organization, but the representative of the union, at the enterprises in Germany. He is the member of the Board Manufacturing Company. So, the Manufacturing Enterprise Council is practically established the necessary contacts between the administration and the trade unions. In the relations between the employers and the employees, these Councils have no right to be taken any sides. They, moreover, cannot organize the strikes, and they are intended to be defended the interests of the company, as a whole. So, such works Councils are existed in all the sectors of the domestic economy. In Germany, 85% of all the workers, who are the members of any trade unions, are entered in the German Trade Unions Association (DGB).

Unlike Germany, the labor market regulation is carried out with the minimum participation of the state and the trade unions in Great Britain. The hired employees have the right to be addressed to seek the protection of their interests in the court or in the tribunal, concerning the labor disputes in the case, if the employer is violated the terms of the employment contract, in respect of the wages, the labor conditions, or the working hours' modes, and etc. So, all the disputes are considered in the framework of the precedent – related case law, where the judges and the jurors assessors thoroughly are investigated the disagreements' causes and the circumstances

between the employee and the employer, and they are made decisions. Thus, this special system has been evolved over the entire history of Great Britain, and it is still being used. Then, the social security system is practically provided the wide opportunities for the income support level maintenance during the unemployment period, in this country.

Thus, the state regulation of the labor market in the foreign countries is aimed at the active labor market policies implementation, as it is evidenced by the «mutual obligations» of the unemployed strategy development and the state, having suggested, that the efficient public services for the unemployed returning to the employment are combined with the measures further development to be stimulated the unemployed to be sought the work, that is expanded the labor supply in the labor market. So, the changes, having introduced into the payment of benefits and the social assistance implementation mechanism, are allowed to be activated the unemployed their own employment, as the employment and the subsequent inclusion into the production process are became economically more advantageous, in comparison with the benefits and payments receiving.

As for the Kazakhstan labor market model, it is being formed, in accordance with the international standards, including the most attractive elements of the existing models, with regard to the real possibilities of their application, as well as the regional particularities, and the peculiarities of the socio – economic, demographic, and political development of the Republic. At present, the new model formation of the employment and the Kazakhstan labor market is, largely, predetermined by the choice model of the economic growth of the Republic. This is meant the own model justification of the accelerated economic growth in the Kazakhstan, using the existing advantages in the country and the most appropriate elements of the foreign experience [4].

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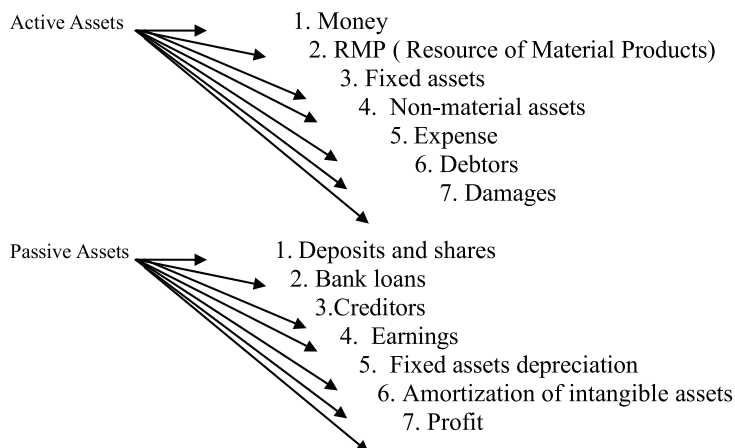
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APPLICATION SYSTEM «5SIS» TO INTENSIVE DEVELOPMENT ACCOUNTING ENTREPRENEURS

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In the transition to market conditions as well as all other entrepreneurs of Atyrau accounting was not easy. To open them different professional courses, conducted trainings, etc. Entrepreneurs for accounting had almost memorize the chart of accounts in accordance with IFRS (International Finance Reporting Standard), which consists of more than 200 types of accounts and their four-digit codes. For intensive development of accounting beginners and existing entrepreneurs, we offer the use of «5SIS» which involves the use of 41 basic accounts. Any entrepreneur, well spend system «5SIS» easily be able to properly maintain accounting records and eventually make its own balance. The system «5SIS» figures are 7 and 41, not only for better memorization, but also because the numbers in the Kazakh people are the most sacred signs. So we know that the accounts are divided into active and passive. To find out which accounts are active, and which accounts passive divide all the assets of the enterprise in two ways: on the composition and placement of sources and their education, and every kind of divide into 7 groups.



Further, these two «sevens», that is active and passive assets are coded in accordance with IFRS and

eventually get easy working chart of accounts, which includes 41 score, 17 of which are active and 24 passive.

Easy working chart of accounts

Active accounts	Passive accounts
1. Money – 1010, 1030, 1040	Deposits and shares – 5030
2. RMP – 1310, 1320, 1330	Bank loans – 3010, 4010
3. Fixed asset – 2410	3. Creditors: A) Taxes – 3110, 3120, 3130, 3140, 3150, 3160, 3170, 3180, 3190 B) Salary – 3350, 3210, 3220, 3397 B) Distributors – 3310 D) Rent – 3360
4. Intangible assets – 2730	4. Income – 6010, 6210, 6280
5. Fixed assets depreciation – 7010, 7110, 7210, 7410, 7470	5. Depreciation – 2420
6. Debtors – 1210, 1250, 1420	6. Amortization intangible assets – 2740
7. Losses – 5610	7. Profit – 5610

Now, form a countable formula.

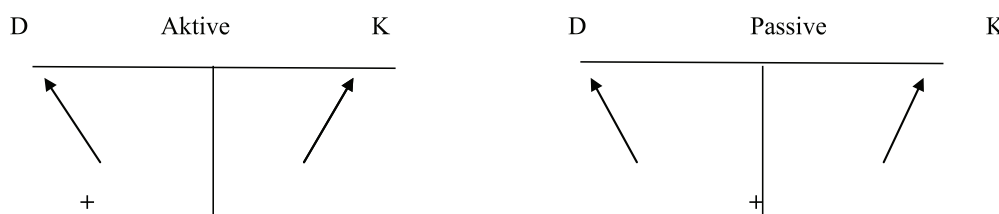


Fig. 1. The Counting Formula

The essence of this counting formula as follows: if the account is active, any increase in it (+) is debited and decrease (–) is credited. If the score is passive, then any increase in it (+) is credited and decrease (–) debited. Let us remember that between accounts under IFRS there is a close relationship, which is called the correspondence accounts. And this relationship or correspondence accounts reflected as a financial transaction.

Now, consider each step system «5SIS» individually on the following example business operation.

I. Received in cash from the founders deposits amounting to one million (1 000 000) tenge.

I step. Carefully read the business transaction (in this example, capitalized cash to the cashier).

II step. Determine the parties involved in this operation. Usually one side gives and the other receives (in our example, the first – party deposits and shares, and the other side – the ticket office).

III step. The present step consists of three stages. Here we define the three elements of the parties involved:

A) Codes (account number).

B) «+» and «–».

C) A and P (active or passive).

Then we obtain (see Fig. 2):

A) According to an exemplary chart of accounts places a four-digit codes of these parties (in

our example, deposits and units – account 5030, cash – 1010).

B) «+» and «–» here we determine the increase or decrease of the parties (in this case, next to the code 5030 put a «+» sign, that is the amount of deposits increases, and next to the code 1010 also put a «+», that is Box Office is also increased. Signs «+» and «–» depends on the contents of business operations. may be «+» and «+»«–» and «–», «+» and «–», «–» and «+».

C) Characteristic refine these accounts (in our example, the account 5030 «Deposits and shares» – passive, and the bill in 1010 «Cash on hand» – active. We use the working chart of accounts in accordance with IFRS (Table). That is Account 1010 top notes letter A (active), and 5030 due to the letter P (passive).

IV step. To do this, we look at the final scheme III step (Fig. 2) and the counting formula (Fig. 1). And we conclude that the 1010 account is debited and credited to account 5030.

V Step. Prepare a draft of the expected accounting entry. According to the rules first written DR, and then CR and recorded programming. V Step ends with the accounting entry, the result is:

DR	CR	Total
1010	5030	1000000

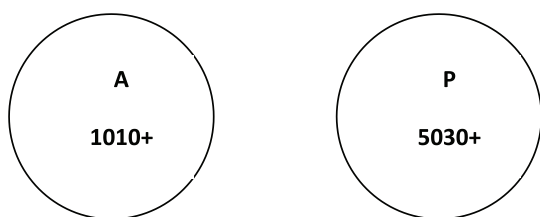


Fig. 2. In the third step

We believe that this system can be successfully mastered by individual entrepreneurs who do not have special economic and accounting education.

Nowadays, every entrepreneur your accounting and tax accounting is an automated form of «1C» or «IP Accounting», he can choose himself – whether to keep records in electronic form or on paper. Mandatory requirements for individual entrepreneurs about bookkeeping is in electronic form no. In particular, especially accounting for individual entrepreneurs operating under the simplified system, painted in the order of the Minister of Finance of the Republic of Kazakhstan dated June 21, 2007 № 218 «On approval of the National Financial Reporting Standard number 1 (NFRS 1)».

Also on the System «5SIS» we offer two options for document management for individual entrepreneurs.

According to a first embodiment of individual entrepreneurs offer the following document, which consists of 10 units (1 book and 9 statements):

- 1) The book of income for SP
- 2) Registers (9 kinds of statements) accounting (the list specified in the standard):
 - B-1 statement for accounting of funds.
 - Statement B-2 on inventory.
 - Statement B-5 accounting settlements with buyers and customers.
 - Statement B-6 accounting of payments to suppliers.
 - B-7 statement on accounting wages.
 - In the statement of 9 – accounting of biological assets.
 - In the statement of 10 accounting movement of fixed assets and intangible assets.
 - Statement Q-11 on accounting for depreciation of fixed assets and intangible assets.
 - A summary statement of B-13.

In the second embodiment, individual entrepreneurs who work on generally established regime, should enjoy a full accounting.

For these entrepreneurs system «5SIS» we offer the following document, which consists of five groups:

1. Source documents.
2. Journal of operations.
3. Cash – negotiable statement.
4. Balance sheet (1, 2, 3, 4 form with an explanatory note).
5. Tax returns.

Note that the use of Atyrau entrepreneurs documentation the second embodiment for the last 10 years, gives excellent results.

Thus, the development of small and medium-sized businesses have always been a priority in Kazakhstan. And now the Government of the country developed regulations or legislation for the grant and protection of common interests and the interests of each of a small and medium-sized businesses, providing the most favorable conditions for business development.

But often, the entrepreneur is difficult to find information on their own, and even more difficult to understand it. Changing legislation, the terms of trade, the rates of duties and taxes, increased requirements for compliance with labor and environmental protection, etc.

We hope that the use of this system «5SIS» will help many entrepreneurs.

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MANAGER OF CORPORATE SOCIAL RESPONSIBILITY: INSTITUTIONALIZATION AND PROFESSIONAL COMPETENCE

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The research manager for the institutionalization of corporate social responsibility (CSR) in countries with «transition» economies. Grounded components and stages of competence CSR manager. The basic professional competence CSR manager.

Transformation of relationships between government, business, and social sector go on in «transitive» economies of CIS countries. While large, especially city-forming enterprises carried out not only productive, but also social function, maintained social infrastructure, polyclinics, kindergartens, clubs, libraries, sport schools, etc. in times of planning economy, the society still expect enterprises (regardless of property form) will take responsibility for everything that goes on in their location in terms of transiting towards market economy [5]. Besides, more and more companies aim

to support their socially-responsible image nowadays. As Western experience shows, a company's reputation depends not only on its profit, but also on its activity in social and ecological area today. Therefore, the strategy of corporate social responsibility (CSR) has become key element of modern corporate management and obtains wider spread in CIS business areal.

The history of active CSR practice development in CIS, in our opinion, began in 2004–2005 due to expansion of corporate technical-scientific complex management and also actions of European Commission and specialized international organizations (Global agreement of UN, CSR Europe, etc). The period of accumulating corporate CSR experience, defining directions and scales of social investments, mastering world practices, and developing specific approached has been going on up to modern days.

On the one hand, in market conditions enterprises pay their taxes that should be transformed into social services by the government, and, on the other hand, they adopt social responsibilities within strategies of CSR, volume of which is defined by owners. However, carrying out significant social obligations draws resources, it decreases a company's competitiveness of domestic companies at the world market [5]. Thus arises demand for specialists who are able to manage new directions of activity for CIS companies that implement CSR and work will all interested groups in coordinating their expectations and basic problems of business.

Head of the Center of corporate social responsibility of Business-University MIRBIS (Russia), Svetlana Gerasimova provides data of consulting company TRIOLIT Executive Search on the developing practical interest towards CSR managers and selecting social managers [2].

In 2006–2007 interest towards CSR area increases. While CSR managers have not been wanted earlier, nowadays HR agencies display positions for specialist as: PR director of foreign branch office of a holding; manager of coordinating corporate relations; deputy head of corporate relations department; head of department of relations with legal agencies; head of managing personnel and regional programmes; manager of ecological safety programmes.

The demand for CSR managers has decreased and shutting down non-profile programmes has been registered due to the crisis in 2008–2009. However, significance of CSR projects' efficiency increases among companies, therefore, candidates of highest qualification are required: head of corporate charity fund; CSR program manager; head of division of personnel management; project supervisor of social policy department; head of external relations department (GR); head of managing operations with regional legal bodies.

In 2010 number of applications from HR agencies' clients for CSR managers remained insignificant. Mainly, head managers of projects «Personnel

reserve» and international PR-projects are wanted. However, a stable growth in demands for CSR managers has been observed in 2011–2012.

Nowadays this sector of labour market is not developed significantly in countries of CIS. Analysis of organization structures of Ukraine enterprises has shown that position of CSR managers exist only in several dozens of the largest companies, for example, «Pharmak», SKM, «Kiyevstar», «1 + 1 media», Ernst and Young, etc. [6–9].

At the same time, employers are not ready to accept specialist with no experience for this position. Thus, head of PR-service of company group «1 + 1» Svetlana Pevelitskaya says: «We have opened position of CSR manager in the end of August and closed it in the end of November, which is too long, since normally we close positions within two or three weeks [6]» About 200 resumes have been received during this period, and short-list included only 4–5 persons who had worked in large international enterprises, where CSR practices are ordered from HQ, and had a definite idea on principles of CSR work.

Growth in demand for professional managers of corporate social responsibility in Ukraine requires the quickest establishment of their training. Employers are even ready to invest into further CSR training of their employees and account such expenses in their budget [6].

Company group «System Capital Management» (SCM) initiated the process of introducing discipline «Corporate social responsibility» into educational programmes of institutions in 2009 [5]. Therefore, ministry of education and science of Ukraine (MESU) has ordered special operational group to develop a program for a new course «Corporate social responsibility» (CSR) for various circles of training as well as a complete set of methodical textbooks. MESU has recommended to introduce this academic course into educational plans of training specialists on courses «Economy and entrepreneurship» and «Management and administration».

The course program has been developed for future bachelors in economy and management as well as engineers (on initiative of National technical university of Ukraine «Kiev polytechnical institute») and presented on the 6th of November 2010 within the council, organized by the network of UN Global agreement in Ukraine and Ukraine Association of developing management and business-education (UADMBE). Coorganisers of the measure are economic faculty of Kiev national university of Taras Shvchenko, National university «Kiyev-Mogilyanskaya academy», Scientific-methodical commission of economy and administrating classical universities of Ministry of education and science of Ukraine [1].

Network «CSR in education» that has embraced 22 universities, has been created on initiative of the center «CSR development in Ukraine»

and UADMBE with support of MESU, companies SKM and GA of UN gradually in 2009–2010 [8]. Over 60 institutions of Ukraine have started to teach CSR discipline during the latest four years.

Although disciplines of CSR have already been adopted by Ukraine institutions, operating specialist are forced to search ways to receive and confirm their knowledge. Therefore, Business Academy of CSR (CSR Academy) was founded in November 2012. It is a partner project of editorial office «Economika» (Economika Communication hub) and center «CSR development in Ukraine», the first business school in field of corporate social responsibility and stable development in CIS [8–9]. Professional course on specialty of CSR manager (stable development manager) can be taken up on full- and part-time basis in 5 months in CSR Academy. According to organizers, such special course can be especially interesting for the whole business society: managers of PR, HR, GR, preservation of environment, protection of labour, employees of charity funds, coordinators of social and ecological programmes who can improve their qualification.

In 2012 University of economy and legal right «KROK» joined the global network (GD UN) on CSR, and National Classifier of Ukraine professions was enriched with three new specialties: «administrating manager on corporate social responsibility», «auditor of social work», «expert of social responsibility». And, since 2013 training masters on the program «Corporate social responsibility» was started for the first time in Ukraine in the university KROK: students, training on specialty «Administrative management» receive two qualifications – «Manager of administrative operations» and «Manager of corporate social responsibility» [6, 8].

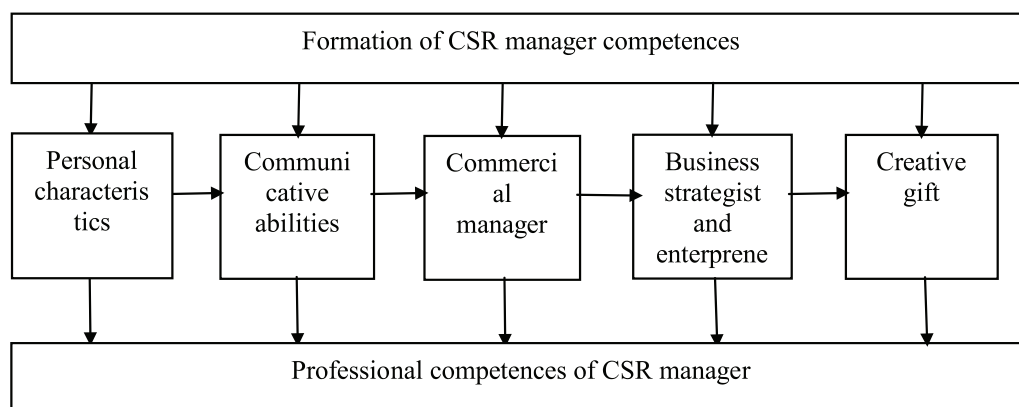
Modern stage of institutionalizing social responsibility in Ukraine is described by the fact that MESU

introduced normative (obligatory) social-human scientific discipline «Social responsibility» for masters in management, economy, and entrepreneurship in 2013. The course program includes topics on forming fundamental knowledge on theory and practice among students as well as professional competences on basic directions of social responsibility [4].

Of course, eight to ten years will pass before the market is filled with graduates, but such approach will allow us to receive trained professionals in field of CSR at Ukraine market, and not trust such a great responsibility to specialist of different specialties.

At the same time, as outlines Head of the Center of corporate social responsibility of PricewaterhouseCoopers of High School of Management of St. Petersburg state university Yuriy Blagov, «... structure of the basic CSR course for bachelors and masters of management, as well as MBA program attendants is pretty similar in Russia and the rest of the world. The main objective of the course is to present the idea of CSR as a system, in other words, give the definition of corporate responsibility, explain a manager's part as one of a person who makes ethical and socially-significant decisions, point out organizational possibilities of managing corporate social activity at both state and global levels. In this case we can account on deep realization of CSR part in business and society» [7].

In our opinion, «manager of corporate social responsibility» (CSR manager) is a complex profession that requires not only a wide range of knowledge and competences, such as skills to form social dialogue and partnership, manage personnel and quality of products/services, understand a specific productive process, problems of non-financial report, etc., but also possess initially high moral qualities and an urge to «make the world better» as well as creative skills (Figure).



Algorithm of forming competences of corporate social responsibility manager

The presented algorithm of forming competence of CSR manager (Figure) is the basis of developing key professional competence – carrying out profes-

sional duties by CSR manager, a deep knowledge of theory and creative transformation of the accumulated practical experience of social responsibility.

According to experts in CSR, GR, HR, and PR [1, 6, 8, 10], as well as CSR practitioners of Ukraine companies [2, 3, 5], analyzing training programmes of the course «Social responsibility» [4, 7, 9], has made it possible to define basic requirements towards CSR manager.

First of all, candidates for a position of CSR manager must respond not only to general requirements (Figure), such as: good basic education, ana-

lytic way of thinking, communicativeness, a skill to work in team, orientation towards economic, ecological, and social result, urge for professional growth and continuous self-development, etc., but also possess overall knowledge in the area of social responsibility.

The complex of such skills and knowledge includes competences, presented in Table in separate blocks.

Key professional competences (functional duties) of corporate social responsibility manager

Direction blocks	Knowledge	Skills
CSR strategies	Concept of stable development; global, regional, and national initiatives in CSR; international, European, and national law in CSR; worldwide and national CSR ratings	Developing, renewing, and maintaining policy of a company in the area of stable development; developing CSR strategy; developing technologies of integrating CSR into business-strategy of a company; maintaining CSR budget; efficiency of CSR projects; CSR monitoring
CSR programmes	Models of managing CSR, introducing CSR practices into the area of personnel management, decrease in ecological impact, increase in efficiency of social costs, promoting principles of CSR and ethical business practices, business-practices of fighting corruption, principles of interacting with local societies	Developing and realizing social programmes, corporate charity, ecology and industrial safety, involving employees through corporate volunteer service, private operational practices, responsible interactions with suppliers, socially-ethical marketing, programmes of personnel development / decrease in staff deficit, personnel health and safety
Relations with stakeholders	Developing map of stakeholders, international policies and practices of interacting with stakeholders	Corporate policies and practices of interacting with stakeholders, collaboration and dialogue with stakeholders (forming constructive relations in terms of CSR); developing and realizing development projects at local and national level
PR-CSR	Preparing information and declaring social responsibility, presenting CSR as a specific advantage, increase in clearness of a company's activity	Introducing communicative program on CSR, internal consultation of employees, reputation management, coordinating social responsibility of departments and channels, interacting with national and international profile institutions, CSR communications through social networks
Social reports	International standards of CSR, standards and training non-financial reports	Introducing social (non-financial) reports, training and promoting CSR reports, composing integrated reports

Secondly, developing corporate strategy of social responsibility at the basis of stable development that implies that a company does not only put effort into its own development, but also considers interests of various involved parties. In our opinion, it is reasonable to refer to major international standards in CSR area in this case: Global agreement (GA) of UN (Global Compact), GRI (Global Reporting Initiative), SA 8000 (Social Accountability International's), ISO 14000 (International Standards Organization), AA 1000 (AccountAbility).

Using the most complete and newest international standard ISO 26000:2010 «Managing social responsibility» has a special significance [10]. ISO

26000:2010 aims for preserving the seven principles of modern social responsibility: accountability, clarity, ethical behavior, maintaining international norms of behavior, securing human rights. Also, the standard indicates and explains basic topics of social responsibility that include 7 points as well: organizational management, reliable business practices, human rights, environment, labour practices, participation in life of societies and their development, problems, linked to consumers.

Thus, corporate social responsibility becomes a key factor of modern corporate management, but carrying out significant socially-responsible obligations draws resources, and it decreases

competitiveness of our domestic companies at global market. Therefore, in order to adapt corporate management to international standards, position of corporate social responsibility manager is introduced into leading companies of CIS countries.

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THEORETICAL ASPECTS OF ECONOMIC POWER

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«XIX century was an industrial century, XX century was a management century, XXI century will be the century of the economic power» [1]. Power is one of the problems of economics, especially of management theory. Power is required for the connection of management and functional activities; integration of work departments in order to meet the market demand and control. The problem of power in economic science is considered in two directions. In economic theory, as Dementiev writes, controversial relation to the problem of power appeared. On the one side, there are economists, who include the power into the economic analysis subject and consider it as the factor, which

affect the important influence to the economic life of society. On the other side, the economic concepts, which deny the significance of the concept of «power» for the economic analysis [2]. In the opinion of A. Movsesian and A. Liebman theory of economic power generates two main directions. Some researchers have focused their attention on the influence of power factor for the efficiency of the economy. Others believe that economic power is the subject of economic theory [3].

Recently, the works of researchers such as Galbraith J.K., Ledyayev V.G., Gungnyak V.Y., Oycken V., Takata Y., Toffler A., Perry F., Dementiev V.V., Movsesian A.G., Liebman A.M. and etc. who studied the economic problems of power, are devoted to the problem of economic power. Most of them point out to the insufficient attention to the study the problem of power.

In Kazakhstan the study of economic power is connected with works of Kubaev K.E. In his opinion, insufficient development of theory of the economic power is explained not by the ignorance of this problem by the economists, but by the non-recognition or misunderstanding of what the problem is outside the scope of research, that it is already relatively independent scientific discipline – the theory of economic systems in the broadest sense, and management theory, in a narrow understanding of the problem.

Different theories and schools consider and estimate the role and importance of power in the economic and social life. In classical political economy there is no problem of the economic power in the economic life. Galbraith J.K. explains the reason for the absence of the economic power in the classics' works by the following way: «for a long time, the authors of formal economic studies believed that those who are related to economic activities do not have any significant power ...» [4].

Since the power is one of the most important social institutions, the problem of power causes the particular interest in the traditional institutional theory. Systematic explanation of the phenomenon of power in economic life is shown in the works of Dementiev V. Describing the nature of power as a ratio that generates power from the world of social relations, Dementiev claimed that it is an interaction between agents in which the agent A (the subject of power) forces to bear the costs in favor of agent B (the object of power) ... The scope and reasonable form of issues of submission which the object of power is ready to carry in favor of its subject, describes the power measure of Agent A over Agent B [5].

The problem of power is investigated in theory of management. At the organization level in the theory of management the power is defined as the ability to influence on the behavior of people in the process of making business. And this power is divided into the power, which has the personal basis and the power, which has an organizational basis. The basis of power in the organization

is the sources from which it arises. The power of example (charisma), the power of information, expert power are called the sources of personal power. Organizational power sources are the following: the right to make decision, coercion, control over resources, rewards and the power of connections.

On the basis of that, we offer the following areas of studying the power problem in the economy:

- the theory of the firm shall include the problem of power, which means to consider the organizational forms of the enterprise in terms of what kind of power structure the economic agents will generate, and how this structure will affect on the efficiency of decision-making;

- to improve the efficiency of the enterprise, as of special institute of economic power, it is necessary to systematize the research of power methodology in the economy.

- as a rule, power is a necessary condition for control of its major and operating force, so it is necessary to develop a mechanism of power for the implementation at the enterprise;

- and most importantly, as notices Rothschild K. the power has to become one of the main objects of study in economic science, both in theoretical and applied aspects.

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*Materials of Conferences***THE ANALYSIS AND APPLICATION OF RESULTS OF CALCULATION OF THE STRAINS APPEARING AT DESTRUCTION OF THE GRANITE**

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This report provides results of solving a problem, linked to defining special features of forming a tense condition of rock when fluid tear crack emerges in it. The process of destroying granite with implementation of plastic substance, forced out along the axis of drilled barehole into the formed crack has been studied theoretically. The process of destruction has been carried out via bar that forced out plastic substance into the formed crack as a result of its introduction into barehole. During the process, the bar is fixed to a manual crushing tool via special spring lock.

Systems of differential equations of the second order that are included into specialized package of computer procession and further analysis of the received data *Comsol Multiphysics 3.5a* have been used to carry out calculations. The ultimate goal of the calculations was definition of horizontal stretching tensions that emerge near peak of a crack, formed along barehole axis, and also around its diametrical section. Further conclusions have been made in accordance with comparing differences of their values.

The following initial data has been used has been used for calculation at the example of granite: destruction pressure, needed in barehole – no less than 40 MPa; barehole radius – 25 mm; length of the formed crack – 0,2 m; utmost stretching tensions – $\sigma_s = 40$ MPa; utmost compressing tensions – $\sigma_c = 200$ MPa; coefficient of crushing tool bar friction against barehole walls – 1; coefficient of filling crack with plastic substance – 0,6; Yung's modulus – $2,8 \cdot 10^{10}$ Pa; Poisson's ratio – 0.33; density – 2670 kg/m^3 ; coefficient of temperature expansion – $1,2 \cdot 10^{-5}$.

The performed work concludes:

1. Actual tensions that emerge in granite during its destruction, are minimal in their module in the area of barehole sector and peak of a crack, formed from it with facilitation of fluid tear.

2. Maximum tensions that emerge in granite, destroyed with fluid tear, are located at the distance of 2–2,5 diameters of barehole that forms a crack.

The following values of the searched indexes of tension and conclusions are typical for granite,

destroyed with fluid tear method under the given border conditions:

1. Facilitation of a bar, introduced into the barehole with crashing tool, is linked to an emergence of friction that causes formation of high (≈ 65 MPa) tensions in the area of its contact with barehole walls and the destructed granite. Destruction of granite does not take place or carries chaotic nature in this area.

2. Facilitation of plastic substance that is introduced into the barehole with its further forcing out into the formed crack, decreases friction and thus causes emergence of low (≈ 40 MPa) tensions in the area of its contact with barehole walls and the destructed granite. In this case it is reasonable to use tension concentrators that create conditions for destroying granite in the required direction. Destruction of rock under relatively low (in comparison to 65 MPa), but initially significant tensions will provide for the formation of straight cracks, set towards the required direction.

3. Partial filling of the formed crack with plastic substance that is forced out of it ($\approx 60\%$) provides for emergence of lower tensions on its area near barehole section (≈ 40 MPa) than on its peak (≈ 55 MPa).

4. The degree of actual deviation of the formed crack from the set direction is defined by the difference between tensions that emerge in crack peak and near barehole section. The greater this difference is, the greater is actual deviation of crack, formed with facilitation of plastic substance, from the set direction.

Scientific conclusion of the work is represented by the following theses:

1. It has been proved that the amount of actual deviation of crack, formed by the method of fluid tear, from the set direction is in dependence on degree of difference between tensions that emerge in its peak and diametrical section of barehole, from which plastic substance is forced out.

2. It has been established that decrease in degree of this difference will allow one to decrease deviation of the formed crack from the set direction.

Practical significance of this work is presented by the fact that decrease in degree of difference between these values are achieved with decrease in fluidity and consumption of plastic substance, forced out of barehole into the formed crack while carrying out mining operations of breaking down monoliths of natural rock in quarries.

This measure provides for decrease in curvature of the broken monoliths and simultaneous decrease in output of solid waste of main production

during its breaking and further cutting into blocks on plants of natural rock procession.

The research result shows that maximum deviation of crack, formed in solid rock (granite, marble, and marbleized limestone) with usage of plastic substances, equals ± 14 mm per each 200 mm of its length (7%). According to our calculations, in case of breaking off monolith of length of 5 m in its rear vertical side, maximum deviation of the formed crack from the set direction will equal 0,35 m. If height of such monolith equals 1,5 m, maximum output of main production solid waste will equal $1,31 \text{ m}^3$ during its breaking in rear side. If width of monolith equals 1 m, volume of the

broken out rock, considering maximum possible waste output will equal $8,81 \text{ m}^3$. Thus, maximum output of solid waste during breaking out monolith of $7,5 \text{ m}^3$ in volume will equal 14,87%.

The results of this study can be introduced into mining industry by suggesting the «Methodics of calculating output of main production solid waste output during breaking out monoliths of natural stone with usage of plastic substances».

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Materials of Conferences

**TREATY BODIES
WITHIN THE INTERNATIONAL
HUMAN RIGHTS SYSTEM**

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In the relationships between international and national human rights law to be considered it is appropriate to refer to the conventions directly related to the treaty bodies. This is about the seven international treaties followed up by the UN committees including the International Covenant on Civil and Political Rights, the International Covenant on Economic, Social and Cultural Rights, the International Convention on the Elimination of All Forms of Racial Discrimination, the Convention on the Elimination of All Forms of Discrimination against Women, the Convention on the Rights of the Child, the Convention against Torture and Other Cruel, Inhuman or Degrading Treatment and Punishment, the International Convention on the Protection of the Rights of All Migrant Workers and Members of Their Families. The treaty bodies (the Human Rights Committee, the UN Committee on Economic, Social and Cultural Rights, the Committee on the Elimination of Discrimination Against Women, the Committee on the Elimination of Racial Discrimination, the Committee on the Rights of the Child, the Committee against Torture and the Committee on the Protection of the Rights of All Migrant Workers and Members of Their Families) abide by these conventions «basic» for the respective committees. The basic conventions and the optional protocols to them include both the international rules related to specific human rights and freedoms and the legal provisions designed to monitor the signatory states' commitment to a certain convention including the provisions on the signatory states' obligation to submit regular reports. Therefore, the basic conventions along with the optional protocols to them contain the fundamentals of substantial and procedural law applied by the committees. As practice shows, in the course of carrying out their activities the committees apply not only the basic conventions and the optional protocols to them but also other international human rights treaties clarifying and specifying the provisions of the basic conventions. The treaty bodies often refer to other international human rights treaties in their concluding observations adopted upon review of reports by the states. Upon monitoring fulfillment by the states of their obligations under a respective basic convention each committee construes its provisions subject to the other international human rights treaties the respective states are signatories to. The treaty bodies also recommended the states submitting their reports to accede to particular international treat-

ties somehow related to the provisions of a respective basic convention. Moreover, the treaty bodies often refer to other international treaties in their general comments.

This raises a question as to if the treaty bodies have the right to apply other international human rights legal framework when monitoring commitment by the states to the basic conventions and the optional protocols to them or if this practice of the treaty bodies is illegal.

It is generally recognized that the international human rights rules and principles constitute one of the branches of modern international human rights law and the established international human rights rules system. The system should be understood as a setup or a structure presenting a unity of consistently arranged and functioning parts. The system may also be defined as something composed of interacting and interrelated elements possessing collectively a quality they do not have separately and presenting a relatively independent unity confronting the environment [1].

The rules contained in the seven basic conventions are an integrated part of the international human rights rules system. The place of these rules in the system to be determined it is recommended to find out in the first instance how important these conventions are in the international human rights legal framework.

For this purpose let us analyze the importance of each basic convention and answer a question as to how they are correlated.

Let us start with the International Covenant on Civil and Political Rights and the International Covenant on Economic, Social and Cultural Rights. It is generally recognized that the international conventions along with the Universal Declaration of Human Rights and the two optional protocols to the Covenant on Civil and Political Rights constitute the so-called International Bill of Human Rights [2]. These two international treaties are the key international legal instruments which along with the Universal Declaration of Human Rights are the centerpiece of the international human rights system. In fact, these conventions specify, elaborate and enshrine in treaties the provisions of the Universal Declaration of Human Rights adopted as a resolution of the UN General Assembly. The ultimate human rights norms contained in the international conventions constitute the centerpiece of the international human rights system. However, due to the fact that the human rights and freedoms are set forth in the conventions mostly as general statements the states found it necessary to clarify, specify and elaborate the provisions on these rights and to enshrine the rights omitted in other international treaties including in the following five conventions: the Convention on the Elimination of All Forms

of Discrimination against Women, the Convention on the Rights of the Child, the Convention against Torture and Other Cruel, Inhuman or Degrading Treatment and Punishment, the International Convention on the Protection of the Rights of All Migrant Workers and Members of Their Families and the Convention on the Elimination of All Forms of Racial Discrimination.

In particular, the Convention against Torture elaborates and specifies the provisions of Article 7 of the Covenant on Civil and Political Rights while the Convention on the Rights of the Child interprets the provisions of Article 24 of the Covenant on Civil and Political Rights and provision 2, Article 10 and Article 12 of the Covenant on Economic, Social and Cultural Rights. The Convention on the Protection of the Rights of All Migrant Workers and Members of Their Families in the first place elaborates and specifies Articles 6, 7 and 8 of the International Covenant on Economic, Social and Cultural Rights as applied to a certain group of relations while the Convention on the Elimination of All Forms of Discrimination against Women clarifies and specifies the provisions of Article 3 of the Covenant on Civil and Political Rights and Articles 3 and 7 of the Covenant on Economic, Social and Cultural Rights.

Although the International Convention on the Elimination of All Forms of Racial Discrimination was adopted prior to the international covenants it, in fact, elaborates certain general provisions of the covenants, namely, Clause 1, Article 2 of the Covenant on Civil and Political Rights and Clause 2, Article 2 of the Covenant on Economic, Social and Cultural Rights.

Having established that the legal provisions contained in the international covenants constitute the centerpiece of the international human rights standards system and the provisions incorporated in the abovementioned five conventions largely specify and elaborate the content of the provisions of these covenants we conclude that the provisions of the covenants and the abovementioned five conventions correlate as the general correlates to the particular.

Actual correlation of the international covenants to the other five basic treatments as correlation of the general to the particular does not mean that the covenants prevail over the other conventions basic for the committees in terms of legal force. None of the seven basic treaties is «inferior» to any other one (ones) as all the basic conventions were originally designed as absolutely free-standing and independent from the international law perspective.

Specific relationships between the seven «basic» conventions go beyond the correlation of the two international covenants to the other five «basic» conventions. The key element of the treaties basic for the committees is that these treaties often regulate related issues of human rights assurance and protection and contain many similar and nearly identical provisions.

Upon review of the relationships between the seven conventions basic for the committees it is important to keep in mind that «rules of law including international legal provisions shall not apply independently: they shall be enforced in co-ordination with other rules of law» [3].

This consideration shall be a starting point for the analysis of a range of specific provisions of international law to be applied in a certain situation. In this context the Human Rights Committee and the UN Committee on Economic, Social and Cultural Rights upon consideration of fulfillment by a certain state of a certain obligation under a certain covenant shall refer to both the effective provision of the covenant and the provisions correlated to the effective provision of the covenant and, particularly, the relevant provisions of the five conventions. In doing so the committees shall consider the fact that the provisions of the convention elaborating the provisions of the covenant shall apply if a respective state is a signatory to that convention. Similar principle shall be adhered to by other treaty bodies with respect to the rules of law contained in the covenants.

This conclusion is recommended to be used as a basis for answering a question as to how justified and lawful is application by all the seven treaty bodies of the basic conventions and the optional protocols to them along with other international human rights agreements that, as a rule, specify and elaborate the provisions of the conventions basic for the committers.

Since the rules contained in the seven treaties are an integrated part of the international human rights standards presenting a system of rules correlated in the process of law enforcement and due to the fact that the rules contained in the seven conventions are mostly of general nature and as a consequence require elaboration the question posed shall be answered positively.

Hence, the treaty bodies have all grounds for relying upon the text of the basic conventions and applying the rules correlated to the provisions of the basic conventions and, particularly, elaborating their content.

However, the aforesaid does not mean that the seven treaties play a special part as compared to the other international human rights treaties and prevail over them in terms of legal force. It would be also wrong to assert that the other human rights conventions are of lower value than the «basic» treaties.

The presence in the abovementioned seven conventions of the provisions on special treaty bodies (*The distinguishing feature of the Covenant on Economic, Social and Cultural Rights is that unlike the other 6 treaties it does not provide for establishing an independent body but imposes controlling functions on the UN Economic and Social Council by whose resolution the UN Committee on Economic, Social and Cultural Rights including experts in a private capacity was established*) is not determined

by any objective common factors but is caused by solely subjective factors that were reflected in the course of drafting and agreeing the text of these human rights treaties. Therefore, speculations by some international human rights scientists including B.G. Manov on the existence of objective causes are seen as unsubstantiated and formal.

According to B.G. Manov, one of these objective factors is that the conventions covering a universal range of issues (in the first instance, the abovementioned «basic» conventions – the author's note) supposedly require creation of special international bodies outside international organizations. In his opinion, conventions focused on a special subject should provide for participation of the international organization bodies in assisting the states in implementing international treaties [4].

B.G. Manov believes that in the former case a need for establishing independent international bodies arises from the fact that challenges facing these bodies are extremely diverse and complicated while in the latter case it results from the fact that relevant international organizations have extended experience in addressing such challenges and very often act as a nerve centre to address a respective issue and to collect the key information [4].

At the same time it must be admitted that classification of international human rights treaties into conventions covering a universal range of issues and conventions focused on a special subject does not stand up to criticism as it is not clear what are the express criteria to refer one convention (for example, the Convention against Torture) to group one and another convention (for example, the Convention on the Suppression and Punishment of the Crime of Apartheid) to group two.

It is also evident that challenges facing both the treaty bodies and the international organization

bodies monitoring commitment to the international human rights treaties may be and are really characterized by extreme diversity and complexity.

As far as the latter argument is concerned, it is not valid either as extended experience in addressing relevant issues is equally inherent to the international organization bodies and the treaty bodies.

Hence, the only outstanding feature of the abovementioned seven conventions is that autonomous international bodies are established and operate for the purpose of monitoring fulfillment by the signatory states of their obligations under these conventions. These bodies are implementing agencies of the signatory states to a certain international treaty and are fully independent in terms of its follow-up. It is critical that international human rights treaty organizations include experts in a private capacity rather than representatives of signatory states as is the case with the most of international intergovernmental organization bodies and a range of autonomous international bodies including international arms control and disarmament bodies.

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