CONTENTS

BLOSSOMING TIME AND RHYTHM OF THE *F.RUPICOLA* AND *F.PRATENSIS* SPECIES

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The work was dedicated for research of the blossoming rhythm of *Festuca rupicola* Heuff. and *Festuca pratensis* Huds. species in the flora of Azerbaijan. It has been identified that *F.pratensis* belongs to the group of the morning grasses, blooms between 4:00-10:00, in the condition of 30 ºC temperature and 80 % of relative humidity. Although some authors include this specie to the group of twice blossoming grasses, in our researche the mass blossoming was observed in morning period. Blossoming of *F.rupicola* goes in porsion way. It repeates 5-6 time in a day. Blossoming reaches to its maximum when the ambient temperature is more than 30 degree and relative humidity is below 60%.
Keywords: F.rupicola, F.pratensis, Festuca, blossoming rhythm

It is determined that the blossoming features of every cereal species depend on the time of the day and weather condition, also every cereal species has certain the blossoming rhythm connected with the temperature and relative humidity. This concept was discovered at the end of XIX by Gordon and Hildebrand (Sergeyeva 1989).

Investigations showed that the daily rhythm of blossoming, if even has deviations connected with weather condition, is characteristic properties of the species and reveals changes within its certain frame. Therefore daily blossoming rhythm can be used as additional determining sign in number disputable issues of cereal taxonomy (Prokudin 1977).

The results of the study of daily blossoming rhythm are of importance not only for taxonomy and also in evolution meaning.

The study of daily blossoming rhythm of polymorph cereal species showed the antecologial differences within species which reveals biological isolation within species (population, ecotype). On base of this, it was proposed that “the demarcation of daily pollination period of populations stipulates their isolations and systematic differentiations that is the beginning of sympatric speciation” (Panomaryev, Rusakova 1968, Prokudin 1977, p.13).

Then concept was studied for different species of *Festuca* genus by Ponomaryov (1960), Tveretinova (1969), Xudyakova (1968), Sergeyeva (1989), Musayev (1991).

The study of the time, rhythm and frequency of the blossoming was carried out by the Ponomaryev’s method (1968).

Concrete number of flower group of every previously selected species was taken under continuous observation during blossoming time of this species. The number of opened flowers is controlled in every 15-20 minutes. Temperature and humidity are measured by humid meter at the same time. The opened flowers are cut during the counting process that will not be confused with the other newly blossoming flowers.

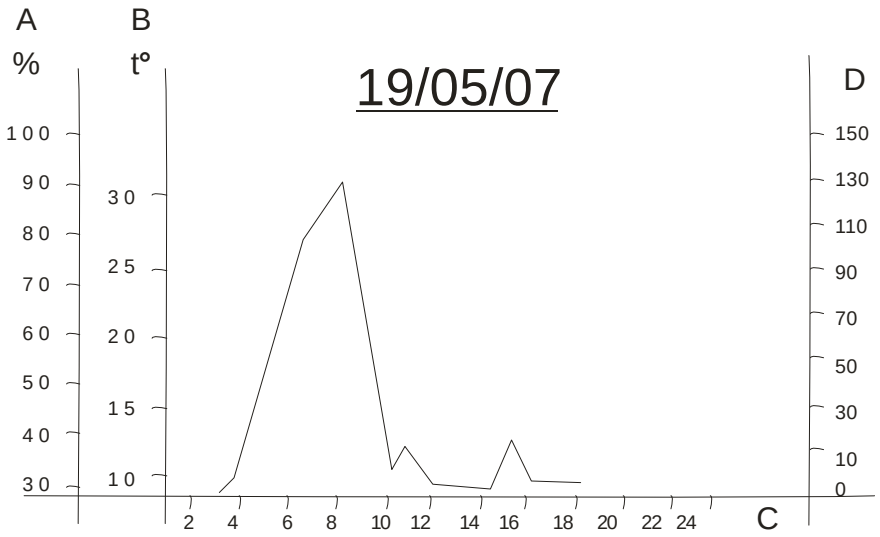
In the research of the rhythm of blossoming of F.*pratensis* the first acts in the group of flowers were noted on 10-18 May (Graphic 1). First pollens were observed on 19-22 May. Maximum blossoming are observed at 7:00-8:00 am. This time an average temperature is 11-15°C and the relative humidity is around of 80%. The temp of blossoming is different. The whole blossoming of flower group takes 7-8 days. Sometimes additional blossoming around 2:00-4:00 pm is observed.

In the classification of Panomaryev F.*pratensis* is referred to both morning cereals and cereals twice blossoming per day due to abovementioned peculiarities.

The difference in blossoming period and daily rhythm of F.*pratensis* is not observed in Azerbaijan flora on various zones. But it can be noted that in East zones relatively earlier blossoming is observed.

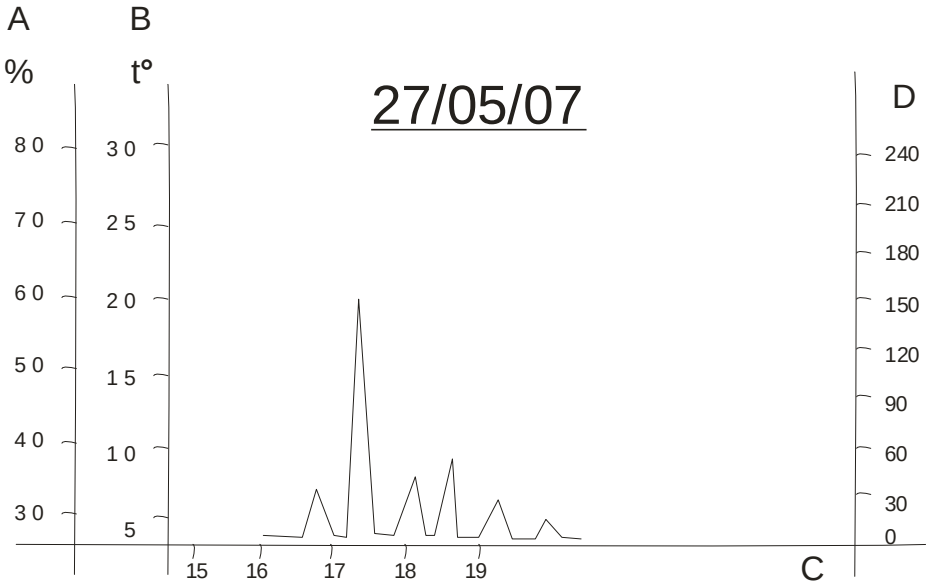
Thus, F.*pratensis* species with characteristic mesophytic signs has blossoming

rhythm occurring at relatively low temperature and high relative humidity. It can be shown as graphic with parameters of day time, temperature and humidity.



Graphic 1. The blossoming rhythm and frequency of *F.pratensis.* A) Relative humidity, B) Ambient temperature, C) Hours, D) The number of flowers

The blossoming of *Festuca rupicola* Heuff occurs by portion way (Graphic 2). First, several flowers are blossomed in separate brooms. Then, flower chaffs are separated and pollens are appeared.



Graphic 2. The blossoming rhythm and frequency of *F.rupicola.* A) Relative humidity, B) Ambient temperature, C) Hours, D) The number of flowers

About 75-90% flowers are opened in a few minutes. Then, approximately during 10 minutes the pollination is occurred.

Such a mass pollination is repeated 5-7 times in 15-20 minutes. The values of the daily blossoming rhythm for F.*rupicola* were tested at 22^0C and 64% relative humidity.

Based on analysis of daily blossoming rhythm of F.*rupicola* can be conclude that this species shows the acute xerophytic properties. As the blossoming of F.*rupicola* occurs by portion way with intervals at the day time with very high temperature and very low relative humidity, which is the important adaptation in phylogenesis.

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LASER-INDUCED SELF-ASSEMBLY OF AN INORGANIC ARTIFICIAL CELL

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The work presents a discussion of principles and practical realization of laser-induced self-assembly of an artificial inorganic cell upon a biological cellular prototype. The results of using the mentioned technologies are given and analyzed in the present work.
Keywords: cell, artificial life (ALIFE), self-assembly, inorganic biomimetics, laser-induced process, dispersion systems

Introduction

At the present moment methods of artificial cell synthesis known from the literature, provide for creation of relatively simplified models of a primitive biological cell. In vesicular bioreactors [1] positioned as biological cell equivalents, there are processes implemented which can also take place in vitro outside the biological cell. The method of intake of artificial genetic systems into vesicles by means of microinjectors for the purposes of injected genome expression [2] – is not perfect, since the genome translation does not fulfill a number of the most important fundamental properties of living systems – self-reproduction, metabolic activity, responsiveness, interaction with the environment etc. In some cases biological cell components are used as the initial material for creation of synthetic cells. Thus, in [3] there is a semi-synthetic artificial cell is constructed with application of protein mixture as vesicles filler. The method [3] is practically similar to [2], where cytosol E.coli is used as vesicles filler. In [4] germ cells were used as vesicular-carrier equivalent – practically, transgenic bioreactor was reproduced only. Analyzing these and other literature data it is possible to come to a conclusion that while using the method of assembly of a biological components combination it is problematic to synthesize an artificial organic cell. The technology approaches (micromanipulators, microinjectors, detection mechanisms etc.) used in the process of assembling artificial cells do not provide for creation of communication system between artificial cell compartments. For this reason it is impossible to reproduce a number of required functional properties, and microscopic objects produced are not the equivalents of a biological cell in the proper sense of the word.

One of the perspective approaches to creation of a biological cell analogue is, from our point of view, the method of artificial cell self-assembly [5]. In [6] there was a reproduction of biomimetic system suggested on the basis of colloidal micelles. Their usage in imitation of biological structures seems justified since the biggest part of biological cell organelles has colloidal dispersity. However performance in cytoplasm is ensured by a number of auxiliary biochemical mechanisms, and in this connection creation of biological systems with sizes of approximately dozens of nanometers, as planned in [6], is almost unrealizable. It could be stated that famous nano-size biomimetic structures can only simulate a certain function of biological systems. Thus, in particular, nano-object with inorganic structure on the clathrate basis, as described in [7] as an artificial cell, simulates the function of biological membranes.

There are methods known of managing colloid structures assembly with the help of laser forceps [8], and also methods of manipulation of biological cells and their ultrastructure [9]. Such laser technologies provide for work with both organic and inorganic dispersed systems [10].

When making laser-optical manipulations with biological microscopic objects it is possible to use at the same time projected or fluorescent visualization of cells structure. It

is possible to project beaming to any detector sensitive in this wavelength range. When using colloidal medium as a detector, sensitized for the spectral range, it is possible to reach interaction of beaming with the medium particles and to activate in the latter the processes of laser-induced self-organization.

Materials and Methods

The authors developed a method of artificial cell assembly, based on the above mentioned principle of laser forceps. As an example, consider the implementation of this method based on a pulsed tunable Ti: sapphire laser CF131MA with a large tuning range (189-950 nm), which allows to vary the parameters of the radiator, depending on the spectral characteristics of a cellular matrix and the colloidal substrate. As the pump source it is possible to use lasers LF114 or LF117, depending on the amount of energy per pulse. Ill.1 shows the flow-chart of the described method (all the intermediate regulators and detectors are omitted for the purpose of simplicity). The emitting system (G) beam is projected to the biological structure (matrix-transparent M), located on a quartz coverslip, and then it gets to the underlying light-sensitive iron-containing colloidal substrate (S), situated in contact with the supported quartz coverslip on a translucent or transparent glass.

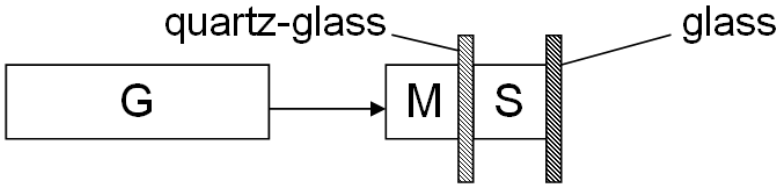

Fig. 1. Installation scheme

Photo-induced processes of self-organization in the colloidal substrate lead to generation of dissipative structures, isomorphic to the cellular structure of a biological transparent M.

The essence of this method is that in the course of interaction with a biological cellular structure beam flux is modulated by the adequacy of the structure: combinational beam scattering at the cell ultrastructure takes place and also a change of its polarization in optically active media of the cells and intensity depending on the extinction of the medium, etc. In output the beam parameters at each point are in compliance with the copied cellular structure.

If we use nanodispersed colloidal semiconductors as a substrate (precursor), sensitized to this spectral range, passing through the M radiation interacts with the precursor (S) and activates in it the processes of laser-induced self-organization at the expense of the generation-recombination phenomena in the semiconductor, which depend on the parameters of the radiation [11]. When placing an inorganic colloid precursor nearby an imitated biological structure along the beam, one can obtain self-organizing dissipative structures isomorphic to the structure of radiant flux in output of the cellular prototype and hence copying its structure to the limits determined by the wavelength.

At a choice of an imitation object and colloidal substrates for laser-induced self-assembly of artificial cells it should be taken into account that beam spectrum in output of the biological prototype should correlate with absorption spectrum of an inorganic precursor with projected beam fluence on it. It is possible to use thin sections and tissue and microorganisms cultures as a cellular prototype. Photo-sensitive materials are used as a precursor, which comply with the above mentioned conditions. For inorganic substrate we used semiconductors in disperse-phase state, polymer-immobilized metal complex medium and also a number of other

materials, preliminary selected by absorption spectrum.

Results

As a result of laser-induced self-organization inorganic copies of biological cells were obtained in a light-sensitive active medium. Obviously the structures obtained differ from the initial precursor in chemical composition. According to X-ray diffraction analysis (Fig. 2, 3), their composition includes the following compounds:

1. $Fe_8(O, OH)_{16}Cl_{1,5}$ (peaks 1, 2, 5, 10),
2. $Fe(OH)_3$ (peaks 11, 14, 19),
3. FeOCl (peaks 8, 10, 13, 15),
4. Fe_2O_3 (peaks 4, 9, 16),
5. minor intermediate compounds.

In contrast to the product of self-organization, the initial precursor is the nature of the noise schedule that indicates a low structural organization of the inorganic substance (Fig. 3). Thus, the chemical composition of the structures formed depends on the spectral characteristics of radiant flux in the output of the cellular prototype.

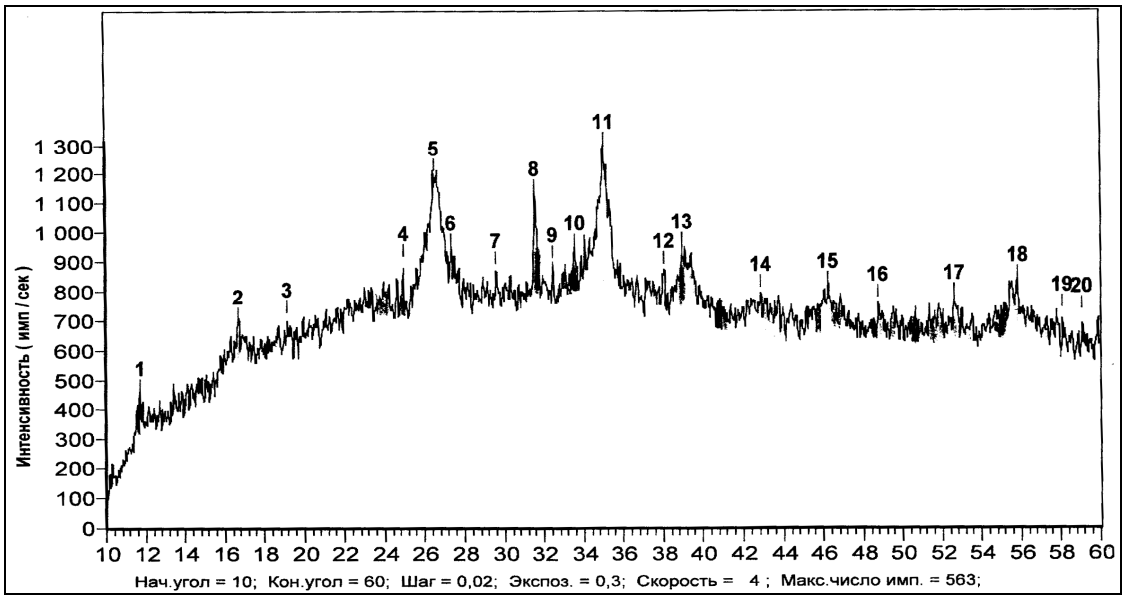

Fig. 2. X-ray diagram of products

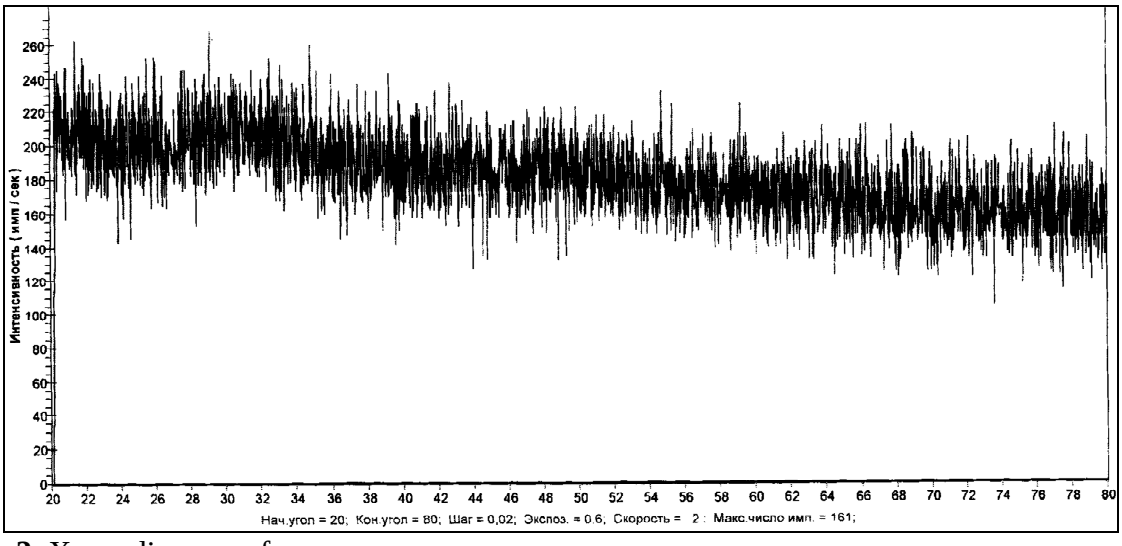

Fig. 3. X-ray diagram of precursor

The biomimetic structures obtained were found to have an isomorphism with their biological prototypes and to possess a number of morphofunctional properties which are also characteristic of the initial biological cells. Fig. 4, 5 are the examples of the technology described above, which present the inorganic imitations of some biological cells.

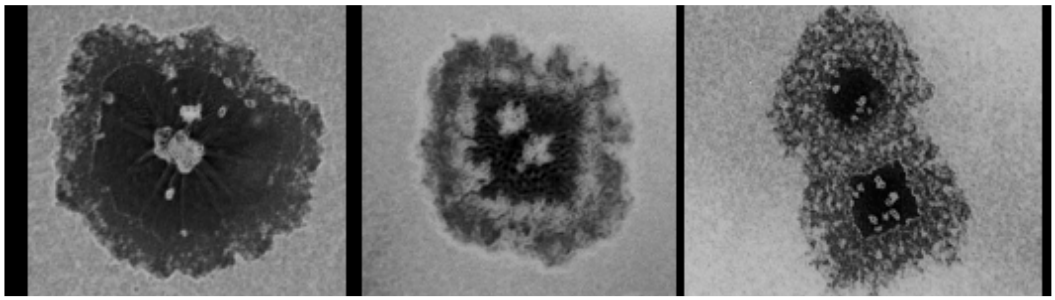

Fig. 4. Cytokinesis of inorganic cells. Stop-motion. Photocopy.

Fig.4 shows stack of inorganic cell division, made with half-hour interval. Closed karyokinesis is observed on 30^{th} minute and citokinesis – on 60^{th} minute. The cell ultrastructure undergoes a number of changes: by 30^{th} minute cytoskeleton elements are disaggregated, by 60^{th} minute the core is dispersed in cytoplasm. In the future self-organization of core and cytoplasm ultrastructures take place again.

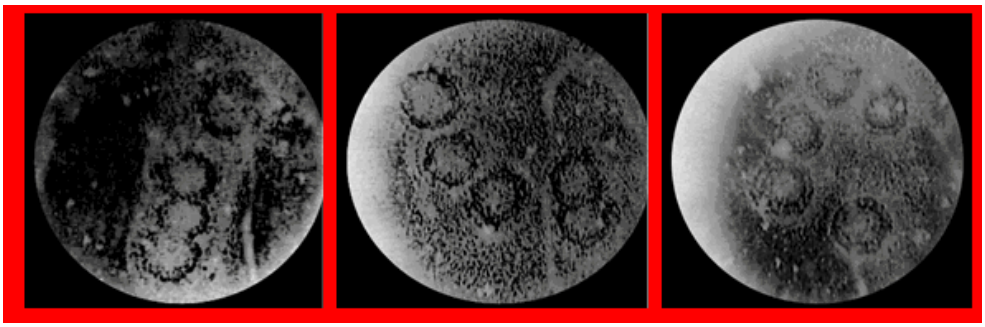

Fig. 5. Rearrangement in a artificial cells column due to cytokinesis. Stop motion. Photocopy

Fig. 5 represents stop-motion stack, illustrating the thesis of inorganic cell dynamics, made with 300-seconds intervals. The first shot shows an intact colony of inorganic cocci consisting of four cells, one of which separates from the colony for cytokinesis realization. At the second shot it undergoes cytokinesis, which is accompanied by cytokinetic rearrangement of the whole colony. The third shot shows further rearrangement, but there are already 5 cells on the shot, and from the opposite pole of the colony another inorganic cell separates, which will undergo cytokinesis in the future in the same algorithmic sequence.

Accept the above mentioned properties; we study a number of functional analogies between biological processes in organic biological cells and their inorganic copies, such as:

1. Membrane selective properties – the equivalent of selective permeability.
2. Active transport of ions and monomers.
3. Reception on membrane, in particular, polytopic coreception.
4. Photo-induced membrane potentials.
5. Endocytosis via vesicular transfer.
6. Respiration and transpiration.

7. Ability to locomotion in media and cyclosis.

8. Optical activity.

9. Homeostasis presence – existence of osmoregulatory systems and ionic pomp analogues.

10. Assimilation of carbon from the carbon-dioxide content (optional).

11. Self-oscillating kinetic modes of reactions in cytoplasm.

12. Electrons transport through donor-acceptor chains.

13. Autocatalysis and cross-catalysis, biothermogenesis.

14. Binary division of cytokinesis-type. Growth and reproduction.

15. Histogenesis and astogenesis.

16. Termination at etiolation.

17. Consumption and active processing of ambient medium matters.

The results of these studies will be published in further articles.

Summary

Using the method of laser-optical assembly, according to biological cell transparent there were adequate copies of biological cell structures produced on the basis of nano-disperse inorganic colloidal media. A transfer from models of substrate-type cells to models of higher structural-functional type was implemented into practice. The produced inorganic structures imitate functioning of biological cells with “life” time of approximately 6 and more months. Structural-functional inorganic models of a biological cell are not substrate equivalents of a biological cell in the chemical aspect.

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PATHOGENETIC CONFIRMATION OF THE USE OF CEREBROLIZINE FOR TREATMENT OF PERIVENTRICULAR LEUCOMALACIA IN PREMATURE INFANTS

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The purpose of this report was summarizing of the results of study in 100 premature infants with preventricular leucomalacia and identification of the gene molecular markers focusing the attention on the population characteristics of the Leiden V factor polymorphisms and mutation of prothrombine G20210A and their effect on the development of intracranial hemorrhages and PVL in the premature infants, and use of preparation cerebrolizine.
Keywords: infants, premature, perinatal lesion of the central nervous system, genes

The different sensitivity to the diseases of children with small birth weight, insufficient of the reliable antenatal prognosis of the unfavourable primary results, for example, development of hemorrhage in the cerebral ventricles and periventricular leucomalacia (PVL) may be witnesses that genetic variants of the blood coagulation factors may be involved in the development of some pathological state in children born with small birth weight. The last investigations showed the effect of the thrombophylia risk factors, such as Leiden V factor and mutation of prothrombin G20210A, on the development of intracranial hemorrhages and PVL in the premature children. However, the genetically confirmed low levels of the blood coagulation factors, such as VII-323del/ins factor stimulator factor polymorphism, may both increase the risk of intracranial hemorrhage (as showed investigations in the adults) and effect on the cerebral circulation disturbances in the premature newborns, for example, on the development of periventricular leucomalacia.

This disease presents serious social and medical problem so the methods of molecular-genetic diagnosis and efficacy of therapy performed acquire the special significance. The cerebrolizine has the required organ-specific efficacy that inhibit effect of Ca 2+-dependent intracellular proteases, such as calpain, and consequently preventing the process of the decomposition of immunoreactivity of sinaptofisin.

The purpose of this work is to summarize the results of study of the gene molecular markers focusing the attention on the populational characteristics of the effect of polymorphism of the Leiden V factor and mutation of prothrombin G20210A on the development of intracranial hemorrhages and PVL in the premature infants and use of preparation cerebrolizine.

Material and Methods

The effect of gene variants participating in the hemostasis was studied in 100 newborns who were born in the Scientific Research Institute of Obstetrics and Gynecology of the Ministry of health of the Republic of Uzbekistan and then observing at the Department of Pathological Neonatology of the Hospital N 5 of Mirobod district during the period from 2007 to 2009 (including criteria: gestation age from 28 to 36 weeks, birth weight < 1500 g). The premature infants who were born at the gestation age 23-26 weeks were excluded from tour investigation because the percent of lethality is very high in this group. The clinical-laboratory methods of investigations included analysis of obstetric-gynecological and somatic medical history of mothers, development of the present pregnancy. The roentgenography of the chest, neurosonography and dopplerography of the cerebral vessels as well as other investigations in association with the traditional methods of examination of newborns. Cerebrolizine was used in dose 1,0 ml during 20 days.

Results

The study included 100 newborns with small birth weight of Uzbek nationality. In this population the genotyping was successful in 53 cases (Leiden factor), 47 (mutation of prothrombin G20210A). Investigation of the infants born with periventricular leucomalacia (PVL) there were found echo-dense lesions which may transfer into porencephalitic cyst and periventricular hemorrhages those were distributed by severity degree: PIVK 1.

Genotyping: all polymophisms were found with use of polymerase chain reaction (PCR) and restriction analysis. Primers and DNA-consequences were selected. PCR was used to study mutation of Leiden V factor and prothrombine G20210A.

On the basis of these data it may be concluded that this will be enough for identification of the total difference 5% of the carriers frequency rate among the children born with small weight and studied healthy children (prothrombin G20210A).

The expected rate of the carriers for Uzbek population of homozygous or heterozygous Leiden V factor was 4.9% and prothrombine G20210A was 3,0%.

This study allowed to reveal mechanisms of the cerebrolizine effect which provide increase in the level of gene expression by postranscriptional mRNA stabilization and improvement of translation efficacy that results in increase of the synthesis of protein – glucose transporter from blood into brain through hematoencephalic barrier.

In order to estimate the changes which were found in the premature infants with PVL after therapy during the study there were used different criteria. The dynamics of recovery was evaluated with use of parameters of clinical-neurological scale.

During clinical trials there was revealed that the earlier beginning treatment with cerebrolizine in the acute phase of PVL the better was functional outcome, and its neuroprotective effect manifested rather quickly and may be detected even on the 5 and 7 day of therapy.

Thus, in the neuropediatrics the therapeutic success was achieved during treatment with cerebrolizine which resulted in significant statistical and clinical improvement of the motional and cognitive functions on the twentieth day, that is, at the moment of the ending acute phase PVL, stopping the process of conversion into organic changes.

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THE ROLE OF MOLECULAR-GENETIC INVESTIGATIONS IN PERIVENTRICULAR LEUKOMALACIA IN PREMATURE INFANTS OF UZBEK POPULATION

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The insufficient reliable antepartum prognosis of unfavourable primary results, for example, development of cerebral intraventricular hemorrhage (CIVH), periventricular leukomalacia (PVL) is one of the current significant problem in premature low birth weight infants (4). We suggest that hemostasis gene variants may play a role in development of some diseases in low birth weight infants.

One of the major directions is molecular-genetic investigation for identification of so called genes candidates. However, study of the results of the measurement of genetic fund remains to be at the early age.

For confirmation of the preliminary investigations of genetic relations with cerebral-vascular disorders we studied effect of genetic variants biochemically connected with hemostasis (factor V Leiden, prothrombin G20210A, factor VII -232 del/ins and factor XII – Val 34 Leu) on the grate number of infants who was born with low birth weight.

Material and Methods

In 200 newborns with very low birth weight who was born in the Scientific Research Institute of Obstetric and Gynecology of the Ministry of Health of the Republic of Uzbekistan as well as in the OPN department of Hospital N 5 of Mirobad District there were studied effect of gene variants participating in hemostasis during the period from 2007 to 2009 (including such criteria as age of gestation from 28 to 36 weeks, birth weight 1500 g and excluding such criteria as lethal malformation, chromosome inherited diseases: trisomia 13 and trisomia 18). The premature infants who were born at the gestational age 22-26 weeks were not included into our investigation because the mortality rate in this group is very high. In many homozygous infants from the parents of Uzbek nationality there was similar genetic phone from 50% to 100%. This significant genetic effect interfered clinical data, that is, genotype/phenotype relations were noted more often in these infants, than in children born from parents of different nationalities. However, these relations may occur due to other genetic factors which were not studied. For this purpose there was taken samples of DNA for studying of its distribution.

There was performed study of genetic associations in the great number of complex diseases for determination of the groups of increased risk. These trombophilic disorders include mutation of Leiden factor V, that results in resistance of factor V to decomposition of activated protein C and mutation of prothrombin G20210A connected with increased plasma prothrombin concentration.

For achievement of balanced hemostasis the structure of thrombus fibrin is considerably depended on factor XIII activity. The XIII factor catalyzes formation of the links between monomer fibrins and includes various adhesive and antifibrinolytic proteins into final thrombus fibrin, that increases mechanical strength. There were performed some studied of the functional effect of factor XIII gene polymorphisms on the structure of fibrin clot and risk of hemostatic disbalance (studies of Cobbervig and Williams). Polymorphism of factor XIII-Val34Leu is the best studied genetic variant because the transmission of the factor XIII-Leu 34 allele has biochemical connection with formation of fibrin mesh structure with thinner fibers, less pores and change of the characteristics of penetration in comparison with fibrin clots forming in homozygous factor XIII-Val34leu. The ef-

fect of prothrombin concentrations on the clot structure indicated that thinner clots were more resistant to fibrinolysis and accompanied increased risk of thrombosis development. In relation to coagulation factor VII there were described many polymorphisms connected with change of the factor VII levels. Two polymorphisms seem to be connected with increase in factor VII levels and risk of cerebral-vascular diseases (factor VII-C122T). Other genetic variants of factor VII including polymorphism of intron 7 and R353Q were connected with reduction of factor VII levels which may have different effect on the hemostatic balance (Mariani e.a.). The stimulator of factor VII-323 del/ins (323 A1/A2) results in 20% coefficient reduction of factor VII coagulant activity.

In relation to effect of factor XIII-Val34Leu polymorphism on the neurological short-term outcome in very low birth weight infants when in children there was noted increased risk of white substance damages (PVL stage 1-2). Besides, alleles of factor XII-Leu34 may be as protective factor in infants born at 23 week of gestation.

Clinical-laboratory methods of examinations included analysis of obstetric-gynecological and somatic medical history of mothers, clinical course of pregnancy, the chest roentgenography data, neurosonography and dopplerography of the brain as well as other investigations in combination with the traditional tactics of surveys.

Results and Discussion

Out of 200 infants with low birth weight 109 children of Uzbek nationality participated in the study as main group and the rest children from mixed marriages were control group. In this population the genotyping was successful in 73 cases (Leiden factor), in 76 cases the mutation of prothrombin G20210A was noted, in 74 cases – factor XIII-323 del/ins polymorphism, and in 78 cases – factor XIII-Val34leu; 98%-99%). The distribution of hemostasis gene polymorphism in low birth weight infants was defined by equation Hardy-Winberg.

During examination of children born with periventricular leukomalacia (PVM) there were observed increased echodense lesions which may transform into the porencephalitic cyst and periventricular hemorrhages which distributed accordingly to the stage: PVH 1(periventricular hemorrhage stage 1) was considered as blood presence in the areas of embryo matrix, stage II – as system with ≤50% of ventricular volume or ventricular extension, stage III – as blood in the ventricular system of >50% ventricular volume or ventricular extension, and stage IV – as blood presence in the ventricular system and parenchymatous lesion with consequent parenchymatous destruction.

Genotyping. All the polymorphisms were found with use of polymerase chain reaction and restriction analysis. Primers and DNA-sequences were selected. The polymerase chain reaction for factor V Leiden mutation and prothrombine G20210A were performed as described earlier. The primer pares for identification of factor XIII-Val34Leu polymorphism were 5’ CAT GCC TTT TCT GTT GTC TTC-3’ and 5’-Tac CTT GCA GGT TGA CGC CCC GGG GCA CTA-3’ (Ddel-digest) and 5’-GGC CTG GTC TGG AGG CTC TCT TC-3’ and 5’-GAG CGG ACG GTT TTG TTG CCA CCG-3’ (Ddel-digest) and 5’ GGC CTG GTC TGG AGG CTC TCT TC-3” and 5’-GAG GGG ACG GTT TTG TTG CCA GCG-3’ (*Hind*III digest) for mutation of factor VII-323del/ins.

On the basis of these data it will be enough for identification of the total difference of frequency of carriers between children with low birth weight or studied healthy children of 5% (prothrombin G20210A and factor XIII-Val34Leu) to 9% (factor VII ins/del).

The expected frequencies of the carriers for Uzbek population of homozygous or geterozygous factor V Leiden are 4,9%, prothrombin G20210A – 3,0%, and factor VII-121del/ins – 19,9% and factor Val34Leu homozygous polymorphism in 3% of children.

Conclusions

Out of 200 infants with low birth weight 109 children of Uzbek nationality participated in the study as main group and the rest children from mixed marriages were control group. In this population the genotyping was successful in 73 cases (Leiden factor), in 76 cases the mutation of prothrombin G20210A was noted, in 74 cases – factor XIII-323 del/ins polymorphism, and in 78 cases – factor XIII-Val34leu; 98%-99%). The distribution of hemostasis gene polymorphism in low birth weight infants was defined by equation Hardy-Winberg.

Finally it should be stressed the effects on the factors of thrombophilic risk such as factor V Leiden and mutation of prothrombine G20210A on the development of intracranial hemorrhages and PVL in premature infants. On the contrary, genetically based low levels of coagulation factors such as polymorphism of factor VII-232del/ins stimulator may both increase risk of intracranial hemorrhage (as showed studied on adults) and effect on the cerebral circulation disturbances in premature infants, for example, on the development of periventricular leukomalacia.

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ENDOGENOUS INTOXICATION AND ADAPTIVE ABILITIES OF PATIENTS SUFFERING FROM OBESITY

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Introduction

Endogenous intoxication (EI) can either conduct various types of diseases or be an independent syndrome[7], thus aggravate clinical course of concurrent diseases. Obesity is a widespread metabolic imbalance and a serious social problem in economically developed countries[5,11]. In the base of obesity lies an energetic disbalance that is often combined with risk factor of cardiovascular pathology – hypertension, hypertriglyceridemia, insulinic resistance and other metabolic disorders[1]. Thus studying common nonspecific adaptive reactions of persons with obesity aimed for development of complex program of rehabilitation measures is practically significant.

The Work Objective is a complex study of endogenous intoxication signs of persons with obesity and of the adaptive condition of organism reactions.

Methods and Materials

100 patients with different obesity intensity at the age of 20-64 have been examined ("Centre of health", Maykop). Average age is 41+-8,8 years; 18 men, 84 women. The control group consisted of 50 healthy people aged 22-55 years, 21 men, 29 women. Ketle index was calculated in order to estimate the accumulation of body fat mass[10]. Chlesterol and its fractions, concentration of antibodies, adaptive abilities of patients according to Garkavi L. were determined by biochemical methods[2,3,8,9].

According to clinical blood test a characteristic of morphofunctional condition of peripheral link of lymphocyte system was studied[6]. In order to do that a lymphocyte index which is a criterion of functional condition of lymphocyte system and an index of organism responsiveness was defined (LI) (lymphocytes/neutrophils, %) as well as a leukocytic index of intoxication (LII), suggested by J. Kalph-Kaliph[4] which allows us to judge indirectly on intoxication degree. LII is calculated by formula: LII = (2St + S) : ((L + MON) * (E + 1)), while St is stab neutrophils; S is segmentated neutrophils; L is lymphocytes; MON is monocytes; E is eosinophil cells. The results were processed by statistic parameter method with t-Student criterion; the results were considered reliable while $p<0,05$.

Results and Discussion

Our attention attracts the fact that women with obesity had a high intoxication index from 2,06 to 5,7 and showed a tendency of reduction in absolute number of lymphocytes to 1459 +- 4,9. The terminal number of erythrocytes is 5,4 * 10^{12} /L; of leucocytes - 14,9 10^9/л; of eosinophil cells - 15%, S neutrophyls - 80%; monocytes – 7%; lymphocytes – 53%; II – 5,7 while physiological oscillation <= 1,5; LMI – 1,8; absolute number of lymphocytes is 4590.

High II from 2,098 to 7,0 was registered as well as a considerable tendency of decrease in absolute number of lymphocytes to 1520 +- 4,7 when studying the men.

For the men with AG a critical number of erythrocytes is 5,3.10^{12}/l; of lymphocytes - 10,3 10^9/l; of eosinophil cells - 10%; S neutriphils – 73%; of monocytes – 13%; of lymphocytes – 52 %; II – 7 while physiological oscillation <= 1,5; LMI – 0,9; an absolute number of lymphocytes - 2952.

Thus, initial high II of men and women is a criterion, that shows abnormalities of adaptive system, that require monitoring while performing endo-ecological rehabilitation.

While analysing clinic signs of patients with obesity (n = 100) the most informative signs were: increase of body mass (100%), memory impairment (94%), overall weakness (85%), short breath (76%), headache (66%), sleep disturbance (65%), bowels disfunction (58%), and appetite disturbance (40%).

These criterions must be considered while performing complex endo-ecological rehabilitation for persons with overweight.

While analyzing patients major classes of immune system signs of disimmunoglobulinemea were found within both men and women (table 1 and 2). Study of humoral immunity of AG patients has not only diagnosis but also a prognosis significance.

Table 1. Immunological index of women with obesity (M±m)

Index	Examined groups		
	Control, (n = 45)	Obesity, (n = 22)	Reliability
Ig G, g/l	12,62 ±0,42	12,98± 0,32	< 0,1
Ig M, g/l	1,68 ±0,11	2,06±0,10	< 0,05
Ig A, g/l	2,48±0,10	3,95±0,11	< 0,05

Table 2. Immunological index of men with obesity (M±m)

Index	Examined groups		Reliability
	Control (n = 45)	Obesity (n = 20)	
Ig G, g/l	12,62± 0,42	10,4 ± 1,81	< 0,001
Lg M, g/l	1,68 ±0,1 1	1,94±0,16	< 0.001
Ig A g/l	2,48 ± 0,10	1, 66 ± 0.32	< 0.05

Problems of diagnosis of complex combination of carbohydrate, lipid, and other types of metabolism disfunction draw significant scientific and practical interest in recent years as well as the discussion of their role in obesity pathogeny.

Obesity, regardless of its nature is always followed be typical alterations: an increase in triglyceride formation, hypertrophy of fat cells, increase of lipolysis in fat tissue, and an inflow of unisterified fatty acids into the liver that leads to increase in synthesis of triglycerides and very little density lipoprotein (LDL), the overall cholesterol (CH) grows.

As our research has determined, a significant increase in CH (6,77±0,3 millimole/l, P<0,001) and triglycerides (2,32±0,13 millimole/l, P<0,01) levels takes place within the women with obesity, and CH-LDL, CH-VLDL, CH-HDL stayed within physiological oscillations and were 1,4±0,02 millimole/l (P>0,05), 0,57±0,02 millimole/l (P>0,05), 0,59±0,024 millimole/l (P>0,05) as follows. The obtained results allow us to suggest, that those indexes show us an integrity of adaptive mechanisms at the whole organism level and they can be the criterions of adaptive stage of obesity.

Alterations in the lipid spectrum of blood that are an increase in cholesterol (7,02±0,12 millimole/l, P<0,001) and triglycerides (2,06±0,08 millimole/l, P<0,01) levels with insignificant increase of CH-LDL, CH-VLDL и CH-HLDL (1,86±0,017 millimole/l, P>0,05; 0,77±0,02 millimole/l, P>0,05; 1,29±0,024 millimole/l, P>0,05 as follows) were detected within the men. The detected shifts of lipid exchange could, no doubt, significantly affect the adaptive abilities of these patients.

A leading role in adaptive self-organization of different functions of belongs to its various vital and, in the first place, metabolic needs. Four adaptive reactions are well-known nowadays: stress, hyperactivation, calm activity, and reaction of training [3]. The detected within the patients with obesity initial adaptive reactions are shown in table 3.

Table 3. Adaptive reactions of persons with increased IMT

№№	Type of reaction	Number (n = 90)	%
1.	Reaction of training	24	26,7%
2.	Reaction of calm activation	23	25,6%
3.	Reaction of heightened activation	18	20%
4.	Chronic stress	18	20%
5.	Reaction of hyperactivation	7	7,8%

As table 3 shows different adaptive reactions take place within persons with obesity. Reaction of training was detected within 24 patients (26,7%), that is common unspecific adaptive reaction and germinates as a respond for various weak irritants. This reaction is characterized by definite index of form element in white blood: an average number of lymphocytes is 23,6; a number of S neutrophils is 67; l/Sn is 0,35; II is 2,84. A high level of responsiveness was detected within 8 patients (28,6 %), an average level – within 6 patients (21,4%), and a high level (high floor) was detected within 14 examined persons (50%).

The reaction of calm activation was detected within 23 patients (25,6%); the of number of lymphocytes is 30; Sn — 57; coefficient of l/Sn is 0,53; II is 2,84 for this group. A high responsiveness level was detected within 16,7% of patients, an average level – within 29,2%, a low level – within 54,2%.

The reaction on heightened activation (18 persons, 20%) is characterized by the number of lymphocytes that is 41; Sn — 56; coefficient of l/Sn - 0,73; II – 1,37. A high responsiveness level was detected within 16,7% of patients, an average level – within 37,5%, a low level – within 33,3%.

For the chronic stress group (18 patients, 20%) a high responsiveness level was detected within 35% of patients, an average level – within 50%, a low level – within 15%.

Conclusion

Patients with obesity have inadequate adaptive reactions at the period of pre-rehabilitation as well as the syndrome of endogenous intoxication. It was marked, that only one third within all the groups has a high level of organism resistance, while in sum an average and low level of resistance was more than 80%, which is a validate criterion for complex rehabilitation measures.

Resume

Patients of different sexes suffering from obesity were studied. It has been determined that an obesity syndrome is followed by expressed signs of endotoxicosis, that is germinate on the basis of disimmunoglobulinemea and cholesterol fractions synthesis disfunction. Authors suggest that an endotoxicosis presence disturbs adaptive reactions of an organism, that was proved by their objective appraisal. Signs of chronic stress were detected within 20% of patients. Detected abnormalities require correction while performing rehabilitation measures within this patient group.

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Materials of Conferences

CLINICAL-IMMUNOLOGICAL PARALLELS WHEN CHRONIC OBSTRUCTIVE PULMONARY DISEASE IN LUNG CANCER PATIENTS

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Quantity of lung cancer (LC) patients and death rate from it is growing from year to year. These facts predetermine people's interest to research of factor estimate assisting tendency to developing of the disease. Medical- epidemiological researches confirm negative role of carcinogen system the leading position among which get metabolites- the smoking products.

The smoking factor as negative trigger unites a number of bronchopulmonary diseases and first of all chronic obstructive pulmonary disease (COPD) and LC as cancer is almost always developed with long term smokers with COPD. That's why it is seen rational to research clinical-immunological differences and similarities COPD and LC as diseases developing on the basis of common target tissue: LC and COPD are diseases with etiologically significant environmental factors.

There is a lot of data confirming the role of chronical inflammation in cancer genesis generally and LC in particular (Baron et Sandler, 2000; Garcia-Rodriguez LA, Huerta-Alvarez C, 2001). It is proved that proliferative and cancerous tissue transformation and also chronical inflammation are dependent on the level of immune alterations, are provided by system alterations of immunocompetent cells, their relations on different levels of pathologic process (Paltsev M.A., Ivanov A.A., 2003; Shvartsburd P.M./ 2006; Macarthur et al., 2004)

It is adjusted that there is estimated cancerous potential when there're different disregenerated changes of lung epithelia against chronical inflammatory lung disease (Kogan E.A., 2003). This is explanation of a fact of often developing cancer against COPD when dysplastic changes and metaplasia of bronchial epithelia are clinical implications.

It's important to mark that the appearance of chronical inflammatory in bronchopulmonary tract with dominating concentration of CD 8+ lymphocytes, neutrophils, macrophages is typical for COPD. Moreover it is typical for COPD clinical accompaniment in the form of progressive bronchial obstruction against anatomical airways remodeling (Jeffery P.K., 2001).

Despite the known fact of COPD and LC development with heavy smokers, till now

there are just singular facts in scientific literature pointing at association of COPD with high risk formation of LC (Kishi K. et al., 2002; Mannino M.D.et al., 2004).

The objective of the research is a clinical-immunological estimate of COPD patients, including those with LC formation.

Materials and methods

Clinical-immunological examination is done for 30 patients with COPD medium severity level and 30 patients with COPD medium severity level with clinical- roentgenologic and histologically confirmed LC in the period from February to May 2009. Male patients aged 40-60 years old with average smoking experience- 20 years are included in the research.

Control group for laboratory research included 24 almost healthy men – volunteers aged 40-60 years old.

There were detected content of main population and subpopulation of lymphocyte(CD3+CD16-, CD3+CD4+, CD3+CD8+, CD4+/ CD8+, CD19+, CD3-CD16+, CD3+CD16+, CD3-CD8+, CD4+CD25+, CD25+ CD4+95+, CD95+, CD4+HLADR+, HLADR+, CD19+CD23+) according to method of ductal cytofluorometry by using monoclonal antibodies, phagocytic activity of neutrophils with cell ability to absorb latex elements and level of B-cell stimulatory factor 2(BSF-2) in blood serum.

Research results

It is known that T-lymphocytes initiate and regulate immune response, perceive antigens, which in their turn influence their activity and population increase. Content of T-lymphocytes in blood is instable an depends on body state (stress, chronic or acute inflammation) (Hodge S.J. et al., 2003).

Characteristics of some immunologic parameters with patients with chronic obstructive pulmonary disease are presented in table 1.

Table 1. Immunological results with COPD patients and control group (M±m)

Result	Control group	COPD patients	
		Without LC	With LC
CD3- CD16+	0,18±0,01	0,476±0.086*	0,426±0.048*
CD4+CD25+	0,12±0,006	0.31±0.057*	0,27±0,026*
CD95+	0,03±0,018	0.227±0.076*	0,248±0,029*
Phagocytic index	40,0±2,1	50,5±4,77**	43,9±2.95**
BSF-2	2,0 ±0,02	9,529±2,97*	14,435±2,1*

– differences are true in comparison with control group (-p<0,01; ** - p<0,05).

Interpreting results from table 1, which include the most changed immunological markers with COPD patients, the following is marked.

CD16+ is membrane antigen of natural killer (NK). Their unique peculiarity- is the ability to spontaneously, without antigen presensitization, kill virus-infected, oncotic and other types of changed cells. It is also known that antigen activation of T-cells leads to interleukin-2 production increase and expression of its receptions on cell surface. It may be a sign of T-lymphocyte activation and their preparation to proliferation. Receptions to interleukin-2, expressed mainly at activated T-lymphocyte surface is characterized as CD25+ - antigens (Kubysheva N.I. etc., 2007)

Our results show simultaneous growth of CD16+ and CD25+-antigen ($p<0.01$), that may show the development of hyperergic immune response influenced by external action.

CD95+ -anigen (Fas) is a cell reception triggering apoptosis (Krueger A. et al., 2003). CD95 – ligand (Fasl) mediate the death of cells sensitive to apoptosis by connecting with CD95+ -anigen. CD95 – ligand is presented in exess on activated T (CD8+ and CD4+) – and B – lymphocytes, NK, lung cells (Ricci – Vitiani L. et al., 2000).

As a part of the study we've discovered tendency to cell number growth, expressing CD95+ - antigen ($p<0.01$).

Apoptosis, being a physiological form of cell death, plays key role in inflammation resolution. High apoptosis of activated T-cells may lead to homeostasis imbalance, leading to overload of local ability of phagocytes and defective clearance. According to Hodge and co-authors (2003), this may potentially lead to saving apoptosis material, additional alteration and inflammation progression. Thus, growth of CD95+-mononuclear with obstructive pulmonary disease may show inflammation progression and correspondingly unfavorable disease.

Phagocytic index (neutrophil percentage, taking part in phagocytosis) is also increased in comparison to control group. Phagocytosis- is an important component of antibacterial defense. Initial defense reaction to any infection depends on recognition of general components for different germs with the help of special cell receptors, which differ from antigen-specific receptors T- and B- cells. Numerous components of germ cells may cause phagocyte chemotaxis in the centre of infection (Roitt A. etc., 2000).

Our research has also shown the growth of BCF2 in blood serum. BCF2 is pro- and antiflammotory delirient, which is the main activator of synthesis of protein of acute phase hepatocyte; it helps involving kidney mesangial cells into inflammatory process, B- and T- lymphocytes and takes part in proliferation induction of the least (especially in the case of B-cells and plasmocytes); acts upon hematopoiesis stimulating its early stages; upon neuroendocrinal system; helps developing fever and adrenocorticotropic hormone secretion. Moreover it suppresses production of interleukin-1, tumor necrosis factor-α and prostaglandin E2 with macrophage, by that helping accomplishment of inflammatory reaction. Stimulatin production of adrenocorticotropic hormone, BCF2 takes part in development of stress reactions also connected with inhibitory action glucocorticoids (Yarilin A.A., 1999).

Thus COPD and LC have the same characteristics of chronic inflammatory process, in formation of which, probably, other components of inflammatory cascade.

Taking into consideration commonality of the participant pathologic process – target tissue, presence of common markers, reacting more significantly (CD3- CD16+, CD4+CD25+, CD95+, HLA -DR+, Phagocytic index, BCF2), the obtained data can be considered as the proof of pathogenetic commonality of COPD and LC and consider them as stages of the same process. Moreover COPD can be considered premorbid stage of LC.

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PSYCHOPHYSICAL ASPECTS OF MAINTAINING THE HEALTH OF STUDENTS WITH LOW ADAPTIVE CAPACITY

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Current socio-economic situation confronts domestic scientists and the public a number of challenges. One of the most pressing - the deterioration of the health of schoolchildren, as confirmed by the medical, psychological, pedagogical and sociological studies. Begun to address this problem, it must be at least two aspects. One is the initial low, significant numbers of children starting their school. Particularly at risk are students with existing mental and physical health disorders. The number of such students in Magnitogorsk, according to statistics is 18% of the total number of children of school age.

The second aspect is a guide to the most, unfortunately, the consequences for the mental and physical health of schoolchildren learning outcomes of the child in school. There is a growing range of diseases of schoolchildren, which can be regarded as occupational diseases of modern schoolboy. Institutions correctional orientation of one of the most important tasks, we can say mission, consider creating the necessary conditions for realization of the rights of students with disabilities to receive education and comprehensive treatment, adjustment and social adjustment. The result of such activities should not only maintain but also improve the quality and quantity of school health, including through the establishment of key social, psychological, speech and cognitive skills of children.

Rehabilitative institutions are ready to share their unique Expertise on maintaining the health of pupils. Thus, for the special (correctional) boarding school № 3 of the city of Magnitogorsk (head Koblova TN) 2010 is a landmark, and now according to a preliminary analysis of the innovative projects we can speak about positive results.For most disturbing fact of residence of students with obviously reduced adaptive potential in the regular school. The reason for this situation is often spontaneous, forced integration.

In the regular school for teaching children with low intellectual development, moving towards reducing the program requirements, the acknowledged underreporting intellectual abilities of children, thereby reducing, and often increasing the risk of psychosocial maladjustment of the child. At the same time losing sight of the constructive possibilities, consisting in the development and consolidation of healthy psychological and physiological skills.

Thus, the modern school requires methods and technologies, aimed at learning self-control, self-knowledge and self-regulation in children with impaired intellectual development, and educated both in terms of differentiated instruction, and at the various models of integration.

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THE YOUNG MEN'S BACTERIAL AND VIRUS PNEUMONIAS CLINICAL COURSE PECULIARITIES AND SPECIAL FEATURES

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The community – acquired pneumonia is being left by the frequent acute infectious disease and the illness not only in the Russia, but and throughout the whole world. The lethality at the pneumonia everywhere has its tendency to the following increase. So, it has been become more difficult to be made the diagnosis of the pneumonia, because of the clinical and the laboratory «golden standard» absence at the half number of those, who has been fallen in with the illness. Thus, it has been become more difficult to be cured from the pneumonia, because of the sick people specific proportion and the specific share rise with the flora resistance to the antibiotics.

The main paper's target has been the pneumonias clinical course, the diagnostics, and the medical treatment peculiarities and the special features study and the examination, having developed against the background of the acute virus and the respiratory diseases (AVRD) epidemical attack in the spring.

Materials and methods

The pneumonias development, the diagnostics, the clinical course and the medical treatment peculiarities and the special features at the persons of the young age at the AVRD seasonal epidemical attack, having been before their illness in the organized

community have already been analyzed. This analysis has been carried out at the 160 men at the age of from 18 up to 24 years (where 20,4 years have been the average age), having accepted into the pulmonological department therapeutics clinic of the Saratov Military Medical Institute.

The sick people have been accepted with the «community – acquired pneumonia» preliminary diagnosis from the pre – admission stage, sometimes it has been very difficult for the duty doctor to make the necessary differentiation and to diversify the AVRD from the pneumonia against the AVRD background. The main reasons for the hospitalization into the pulmonological department, but not into the infectious one have been served the following criteria: the discomfort or the pains presence in the chest at the breathing, the physical data asymmetry at the chest examination, and the instrumental – laboratory characteristics.

Results and discussion

The sick people have been entering on the 2-nd – 7-th day just from the invasion disease. The non – difficult pneumonia clinical course has already been fixed it up at the 73% patients. The 12% sick people with the difficult clinical course have been lying in the resuscitation and in the intensive therapeutics department from 24 hours up to 480 hours (e.g. from 1 day up to 20 days). The double – sided inflammatory process has been at the 14% sick people.

The bacterial and the virus pneumonias clinical course analysis has been revealed the following regulations: the sick people high per cent with the hectic fever and the febrile fever (e.g. 68%), the fever large prolongation, in spite of the intensive the therapeutics. The 2 – 3 temperature rise waves have already been registered at the 1/3 sick people, and on the average, the days quantity with the temperature rise have been in 2,3 times more, than at the usual pneumonias. So, it has been succeeded in to be fixed it up the disease viral phase by the instrumental – laboratory changes at the 42 patients, having entered within the early time limits from the disease invasion. Thus, the leukocytosis has been made up in the range from $4x10^9$ up to$10x10^9$; the relating to the stab shift has been absent, the (ESR) has not been exceeded 15–20 mm/hour. The lung pattern strengthening has been registered at the digital photofluorogram. Then, the expressed inflammatory changes have been appeared in the complete blood count (CBC), the considerable fibrinogen rise, having had its maximum up to 7,7 g./l. at the bacterial stage growth. The fine and the clear infiltration has been begun to be exposed by the X – ray method. The acute respiratory compromise has been fixed it up at the 8,4% sick people, the further complications in the form of the toxic – infectious nephropathy – at the 27% ones; the myocarditis – at the both patients; the toxic hepatopathy – at the both patients.

The antibacterial therapeutics has been carried out since the first presence day in the hospital. The penicillinic series antibiotics, the III – rd and even the IV – th generations cephalosporins, the erythromycin group antibiotics, the fluoroquinolones have already been used. The 8% sick people have been received the both antibiotics, at the same moment. The antibiotic change has been carried out – at the 6% sick people.

Thus, the early pneumonias development has been the main peculiarity and the specific feature of the spring epidemic attack of the respiratory viral infections in this year. These kinds of pneumonias have been arisen at the sick people part on the 2 - nd – 3 - rd disease day against the AVRD (e.g. influenza) clinic background. So, it is very difficult to be diagnosed the initial pneumonia under all these conditions. The duration and the fever clinical course variable surge rate have been conditioned by the disease viral constituent presence. The antibacterial therapeutics has been exceeded the common standards on the terms at the patients half.

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ASPECTS OF THE PRESERVATION OF HEALTH PROBLEMS IN CHILDREN AT SCHOOL

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The end result of policy of any state is the health of the younger generation, which is an indicator of sustainable development of the state, its economic reliability and national security. In this regard, the most important social task of the state is to create conditions for the full development of children and adolescents with the use of modern innovative educational technologies. For the modern school has all the features of the intensification of educational process, makes high demands not only of their students, but also to the systems, providing the intellectual growth of children. All this together could negatively affect the health of children and the process of creative self-realization. In the absence of the school element of competition associated with the focus on high performance, children can not cope with the program, easily develop an inferiority complex that has negative consequences for subsequent personal growth of schoolchildren. These processes increase the risk of psychosomatic disorders in schoolchildren. Particularly dangerous consequences for the growing body of children in terms of development of psychosomatic deviations in health are due to periods of training related to the change of mode of training activities and level of intensity of training programs. The data in crisis periods of training is first class, stage of transition to a meaningful education and preparation for a single

state exam in high school. It is in these critical times a tendency of children to get away from real-world problems in the world of illusory prosperity caused by the influence of alcohol, drugs and toxic substances.

In modern conditions, in situations where a child does not meet the high requirements of the educational program and has a deviation in the psychosomatic health of its transfer to classes for teaching children with mental retardation or in the classroom teacher support, curriculum that is designed for children with deviations in intellectual development. The situation with regard to the full intellectual development of children, but in a state of mental fatigue is the most negative consequences for the process of fully achieving their potential, which may not be complete if less intellectual relevance of training programs in these categories classrooms.

On the other hand, children and teens - this is the unique sensitive period during which most easily and naturally is trained in self-monitoring and self-regulation, the strategy of constructive behavior, leading subsequently to an effective self-realization, the most complete manifestation of the intellectual and creative potential of the individual. Thus, one of the most pressing practical problems of the modern school is to create a healthy educational environment for students through the introduction of scientific and practical technologies that address adaptation abilities of children in different age periods and include activities to effectively reduce the manifestations of intellectual voltage.

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THE PLACENTA LYMPHATIC BED NON-DEVELOPMENT

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The lymphatic bed (LB) is being formed by means of the embryonic veins collaterals blocking from the blood flow: the arteries with the tunica externa are being intussuscepted into the extraorganic veins together with their endothelial walls, having separated the veins' peripheral part into the lateral pockets. The veins widening in the intensively growing organs surrounding is being resulted in the veins central canals communications contraction and the interruption with their lateral pockets, in the separation from the lymphatic fissures veins with the endothelial lining. The fissures are being conjugated into the lymphatic sacci and the trunks. The two umbilical arteries without the multiple branches are being belonged to the umbilical vein with their endothelial walls. The embryo's thick umbilical cord is slowly being grown in the length, and it is not being spiralized at all. The elastic Wharton's jelly is being increased its resistance to the external pressure. The fetuses' umbilical cord is being spiralized, but the umbilical vein walls are already being included, as the tunica externa, well as the tunica media. The placenta vascular bed without LB is presented itself the particular case of the cardiovascular system development, which, in its turn, is confirmed the vessels adequacy to the serviced organs structure and the corresponding functions. Having taken into consideration the LB laying mechanics, its morphogenesis would be able to be caused the blood supply disturbance and also the embryo death in the umbilical cord, and in the placenta. The placenta embryo drainage is being organized through the intervilliferous lacunas into the uterine vessels. So, they are usually being appeared, as a result of the endometrium vessels strong deformation and the following destruction in the process of the embryo implantation.

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ABOUT PREVALENCE OF ALLERGIC DISEASES IN VOLGOGRAD FIRST-YEAR STUDENTS

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Many factors such as ecologic and genetic ones, chronic diseases, smoking etc. can influence development of allergic diseases.

The aim of our study was to determine the prevalence of allergic diseases in first-year students of four Volgograd institutions of higher education in dependence of their residence before the matriculation.

1200 students have been asked using questionnaire. There were 624/1200 (52%) residents of Volgograd (group I) and 576/1200 (48%) residents of Volgograd region (group II) among them. 37% students from group I visited allergist and allergic diseases were diagnosed in 24% of them while there were 23% and 12% in the group II, respectively. The prevalence of allergic rhinitis was 62% and 72% in group I and II, respectively. At the same time there were some differences between groups in clinical duration of the disease. So city residents mostly often have symptoms in summer (during grass pollination) but region residents mostly often have them in spring (the period of trees pollination). The second place belongs to bronchial asthma in both cases (15% and 14%, respectively). Urticaria was diagnosed in 14% students from group I while nobody from the second group gave positive answer to this question.

The prevalence of chronic tonsillitis was 48% and 56% students who have allergic diseases from groups I and II, respectively.

The prevalence of smoking more than 5 years was similar on both groups (25% and 21%, respectively).

Thus the prevalence of allergic diseases in Volgograd residents is higher in 2 times than in Volgograd region ones. It may be due to many factors including ecologic and social influences.

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PROBLEMS OF EARLY DIAGNOSIS OF CHILDREN WITH SPEECH PROBLEMS

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Problems of early diagnosis of children with speech problems problem early intervention for children with special needs at the present time is extremely important as the proportion of healthy infants in recent years, declined today to 80% of infants are physiologically immature, about 70% have prenatal pathology (Volosovets T.V.). In Russia the experience of early intervention is based on data from scientific and practical activities psychological, medical and pedagogical counseling preschool children at the Institute for Special Education Russia Academy of Education. They argue convincingly that a well-organized early correction can prevent the emergence of secondary abnormalities in development, to maximize the rehabilitative potential, and for most of the children opens up the possibility of the general education stream and eliminates the need for special expensive education.

The existing arrangements for children who have, backlog and problems in development, does not fully meet the needs of the family and does not provide comprehensive care, since the majority focuses on children older preschool and early school age. Earlier intervention would significantly reduce the degree of social failure of children to achieve the maximum possible for each children's level of overall development, education, integration into society. Early correction of deviations in the development of children worldwide is a priority for special education and psychology. Programs for young children from birth to three years behind in speech development are considered as social where a large role for the family, the mother in the implementation of individual development programs. The existing system of health care - psychological and educational assistance has serious shortcomings that are expressed in the absence of the succession and continuity of adequate measures. In these circumstances, a clear need for restructuring the entire system of health care - psychological and educational assistance not only for early diagnosis and prevent the birth of disadvantaged children, but also the relationship of dynamic tracking of children at risk. However, children under the age of one year, outside the field of view of psycho-medico-pedagogical commission, as well as predominantly observed in children's clinics, which currently is not always provided psycho - educational diagnosis, and hence missed the most important sensitive time in the formation of psychomotor functions. A child with developmental disabilities, began training in the first months of life, has the greatest chance of achieving as quickly as possible the best opportunity for him the general level of development, and accordingly, the earlier date selection of integrated learning. Early diagnosis and appropriate organization of early remedial assistance or pedagogical support will prevent secondary disorders in children at risk.

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ORGANIZATION-ECONOMIC MECHANISM OF TECHNICAL REEQUIPMENT AND BUSINESS DEVELOPMENT PROGRAM BUILDUP

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Actions of technical reequipment and technological retrofit are quite diversified. That's why for their selection different methods are needed, and difficulties in applying one method may occur. While choosing methods and criteria of efficiency estimate and the following selection of actions of reequipment and technological retrofit level of action becomes determinative. In the article an organization-economic mechanism of technical reequipment and development of industrial business program buildup was described, methods and criteria were marked, on which basis actions of technical reequipment and technological retrofit of different levels of planning are selected.

A problem, connected with technical reequipment and technological business manufacture retrofit is a difficult, multiobjective goal. The difficulty is that actions of technical reequipment and technological business manufacture retrofit are quite diversified. They differ by the variety of input objects, the diversity of pursued aims, level of risk, the extent of influence on business strategy, level of planning. That's why different methods are required for their selection, and certain difficulties appear while applying only one method.

While choosing methods and criteria for estimate of efficiency and the following selection of actions of technical reequipment and technological retrofit, in our opinion, level of action becomes critical.

Management of investments of technical reequipment and technological retrofit is carried out on 3 levels: strategic, tactic and operational.

On strategic level there's buildup of strategic development plan of a business. In the plan there are determined long term aims of technical development, separate strategic objective norms and results which give opportunity to work out concrete solutions for organization-technical actions plan and technical development plan on tactic and operational levels and also realization of separate actions of technical reequipment and technological retrofit on operational level. Moreover, strategic development plan provides realization of concrete long term projects, which are strategic for the business. Included in the strategic development plan projects appeal to achieve significant competitive advantages and should promote business to come on new technological and technical level. While realizing strategic actions new innovation products may be worked out and implemented, heavy duty machine system may be obtained, automated control systems may be implemented. As the research shows, strategic projects, providing business development are characterized by high risk level, as investment opportunities with the most potential of value creation often appear in the circumstances of uncertainty, caused by technological and productive innovations, consumer behavior changes, deregulation processes in economics and etc. However, how paradoxically it may sound, uncertainty often creates opportunities for business, which can be realized only with the help of investments. Such projects contain opportunities of development which by analogy with financial options may be called development options. Thus, strategic development plan buildup may be concerned as buildup of future opportunities for business development or as buildup of development option portfolio. That's why while estimating economic efficiency of strategic actions of technical reequipment and technological retrofit, option apply as an instrument of strategic investment estimate, free from disadvantages of

traditional methods, is possible. Apply of real option method while estimating economic efficiency of projects, aimed at production of new products and technologies, is more reasonable.

The worked out development strategic plan gets its following concretization in the process of current investment management of technical reequipment and technological retrofit by technical development plan and organization- technical actions plan buildup. Unlike strategic development plan, buildup of technical development plan and organization- technical actions plan is a medium term management process, realizing as part of strategic solutions and tactic investment opportunities. We should mark that though both plans are worked out for midterm, technical development plan may be designed for a longer term than organization-technical action plan.

Organization-technical action plan is traditionally worked out for one year. Technical development plan may be built up for the period 1-3 years, depending on lead time of action on technical reequipment and technological retrofit.

Technical development plan and organization- technical actions plan are closely connected with each other. Actions of strategic importance are included in technical development plan. These are actions of working out and implementation of new products and also modernization and constructive modification of ready products. Organization- technical actions plan has secondary meaning. It includes actions, which are necessary for realization of a technical development plan: equipment buy, necessary instruments and machining attachment buy and production, also a part of strategic actions- implementation of new technological processes and perfection of the existing one. Besides it includes actions without opportunity of development but conducing keeping the existing business position- modernization and change of old equipment, instrument by new ones, more productive types, actions of quality improvement of the manufactured products. Actions of technical development plan and also some actions of organization- technical actions plan represent realized opportunities of business development, in other words they characterize extent and quality of using these opportunities, besides their realization increases business cost. That's why option method, method of economic value added EVA, method of share value added SVA are possible for their selection.

Other actions, containing organization-technical development plan should be selected using criteria based on discounting - NPV, IRR, PI, PP and also traditional activities of economic efficiency estimate – economy(nominally annual and from the time of implementation), cost saving for 1 ruble of market products and for 1 piece of a product, nominally-annual and from time of implementation economic effect, payback time.

In turn process of tactic management of technical reequipment and technological retrofit investment gets more detailed accomplishment in operational management of action realization of technical reequipment and technological retrofit. Operational management of action realization of technical reequipment and technological retrofit, orientating on business built up plan of organization-technical actions and plan of technical development and objectives of their management in short term period, provides working out of operational investment solutions in part of separate actions for reequipment and technological retrofit. These actions are planned for short term (up to one year) and comprise not the whole business but directed at improvement of separate manufactures, workshops, sections. There's no need to use lengthy calculations, to conduct marketing research and risk analysis. When estimating their economic efficiency it is useless to use criteria based on discounting NPV, IRR, PI, PP and etc. (considering short term planning – up to a year) and it is possible to use such traditional activities as economy (nominally annual and from the time of implementation), cost saving for 1 ruble of market products and for 1 piece of a product, nominally-

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THE COMMERCIAL BANKS LIQUIDITY AND THE SOLVENCY UNDER THE CRISIS CONDITIONS

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The Kazakhstan banking sector is the main capital redistribution channel just from the financial one into the economy real sector. At the last time, the state is undertaking a great number of the various actions and the different measures for the domestic commercial banks support and the stimulation under the crisis conditions. But the Government is not quite able simply to be directed all the necessary resources for all the existing challenges overcoming. In connection with this, it is necessary to accept a number of the measures on the further banking market development provision for the banking sector support.

As it is generally known, the crisis in Kazakhstan has been begun from the banking sector, in particular, because of the loans refinancing conditions deterioration at the international capital markets. Though at the initial crisis stage, the speech had not been touched on the banks default, it was quite evident for the state, that the banking sector is not quite able to be supported, at the same time, the crediting at the last years level, and, simultaneously, to be carried out the payments by the benefits by the obligations before the external creditors.

In the crisis period, the commercial banks have not simply limited their crediting, but and they have become more carefully to be financed the economy on the wave of the business activity lowering throughout the world, and, in particular, in Kazakhstan. Even those banks, which have not the large debt load by their external loans, have preferred to be reserved their cash and the liquidity under the branch development shrouded perspectives conditions, but not to be limited the loans to the economy real sector. Such kind of approach is being replied to the common sense of some private investor, against the background of the crisis phenomena, but, at the same time, it is against the state's policy view, in respect of the market stabilization [1].

And this, really, has created the whole challenge: the banking sector in Kazakhstan is the main capital redistribution channel just from the financial one into the economy real sector, and it is quite, obviously, that neither the fund market, nor the state are not able to be replaced it by themselves. And it is not much surprisingly, that the Republic of Kazakhstan has already undertaken a great number of the quite various and the different activities, having directed for the domestic commercial banks support and their stimulation for the last time.

At present, the Kazakhstan's banking sector is being experienced several challenges, which have already overgrown from the local one into the national scale. So, one from them – is the challenge loans share increase, as a result of the earlier distributed credits and the loans encashment worsening. The other one, not less the significant challenge – the large external debt paying off necessity, which is negatively influenced upon the system open market account balance with the Kazakhstan's capital and the finances. As it will be seen further, the Government is not quite simple able to be directed all its budgets and the resources for the further all these challenges overcoming, as and the other ones, which are not less serious macroeconomic challenges and the tasks are being needed to be resolved and the necessary solution, having stood before the Kazakhstan.

The Kazakhstan's banks external commitments and the obligations volume, for the period from September, 1, 2008 up to January, 1, 2009 is being made up 12 bln. dollars order [2, p.24]. At present, there are not any challenges with the liquidity and the cash position in Kazakhstan, and a number of the large international financial companies' bankruptcy is quite able to have an influence indirectly upon the situation in Kazakhstan.

By the preliminary data, the Kazakhstan's commercial banks have already received the net profit in the sum of 4,6 bln. tenge (e.g. the current one 150/$1) in January

of 2009, that for 6,4% is more, than in January of 2008, and the latter figure is indicated in the widely – spread of the state Financial Examination Agency (FEA).

For all this, the second level banks incomes aggregate amount, by the FEA data, has been made up in the sum of 697,7 bln. tenge in the accounting period, having increased in 3,3 times, in comparison with the similar period of 2008 [3]. By the FEA information, the aggregate assets of the Republic's banking sector have been made up 11.922,6 bln. tenge, by the estimate on February, 1, 2009, and they have been increase for 0,2% during January. In the meanwhile, the aggregate calculating proper capital has been decreased for 0,4% down 1.939,5 bln. tenge during the reporting period. So, in accordance with this report, the capital adequacy activities have been made up k1 — 0,13; k2 — 0,15 at February, 1, 2009 (at February, 1, 2008 — they have been made up k1 — 0,12; k2 — 0,14).

The liquid assets share to the banks' aggregate assets at February, 1, 2009 has been made up 14,1%. The banks' lending portfolio, adjusted for the interbank loans, has been reached 9,117 bln. tenge, by the estimate at February, 1, 2009, and they have been decreased for 1,4% during January. For all this, the Kazakhstan non – residents' loans at February, 1 of the current year have been made up 1.533,7 bln. tenge, or 16,8% from the lending portfolio (e.g. this activity has been made up 1.401,6 bln. tenge, or 15,9% at February, 1 of 2008).

The standard credits share has been made up 41,3% in the structure of the banks loan portfolio, by the estimate at February, 1, 2009, (where, at February, 1, 2008 — it was 41,7%), the doubtful ones — has been made up 53,9% (e.g. 56,5%, correspondingly), the hopeless ones — has been made up 4,8% (e.g. 1,8%). The total credits, having related to the 5 categories doubtful loans and to the hopeless ones, has been made up at the reported date 818,1 bln. tenge or 9% from the aggregate loan portfolio (e.g. at February, 1, 2008 — it has been made up 3,9%) [3].

The loans, at which there is the delinquent arrears by payments, which are more, than 2,160 hours (e.g. 90 days), at February, 1 of the current year, have been made up 527,8 bln. tenge or 5,8% from the banks loan portfolio. The provisions volume by the loans, by estimate at the reported date, has been made up 1.085,5 bln. tenge or 11,9% from the loan portfolio (e.g. the increase for January has been made up 5,8%). The credits for the economy (e.g. without the natural persons record) at February, 1, 2009, have been made up 7.099,7 bln. tenge, having decreased for 0,8% during January.

For all this, the subsequent increase has been observed in the following branches: the post and the communication — for 19,5%; the industry — for 7,0%; the transport — for 2,2%; the trade — for 0,9%; the individual activity — for 9,4%; the agriculture — for 4,9%. At the same time, it has been fixed it up the subsequent decrease for such following branches, as the non – production – related sphere — for 5,7%; the building — for 4,8%.

It has also been stated in the report, that the deposits total amount, having attracted by the banks from the natural persons and the juridical persons (excluding the banks and the international financial organizations), has been made up 6.872,6 bln. tenge for January 1, 2009, having increased for 7% during the 2008 year, including the natural persons deposits amount has been made up 1.500,3 bln. tenge (e.g. the increase has been made up for 3,6% during 2008), the juridical persons — has been made up 5.372,3 bln. tenge (e.g. the increase has been made up for 8%, correspondingly) [3].

The aggregate commitments have been made up 10.478,8 bln. tenge, by the estimate for the reported date, from them the commitments before the non – residents have been made up 4.610,1 bln. tenge or 44% from the aggregate commitments, having decreased for 1,7% for the reported month. The Republic's banking sector has been presented by the second level 37 banks, by the estimate for February, 1, 2009. Thus, the Kazakh-

stan's population is being exceeded 15,7 mln. people.

The world financial and economic crisis has been heavily influenced upon the Republic of Kazakhstan banking system very much. In particular, the Kazakhstan's National bank has been provided the shirt – term liquidity and the cash position to the commercial banks in the large volumes. The operations cash flow has been made up about 40 bln. dollars for the second half of the last year. The President of Kazakhstan has charged with the important mission to allocate about 4 bln. dollars funds for the banking system support. As a result, the current situation with the liquidity and the cash position has been sharply improved to the end of the 2008 year [2, p. 24].

So, the financial and economic crisis in Kazakhstan has been connected with the factors series, one of which — has been the following rise in the inflation. By the official data, the inflation has been made up 19%, by the unofficial ones — it has been 40% in the Republic in May of the 2008 year.

Thus, the Kazakhstan banks will be needed to be paid off the 12 bln. dollars of the external loans up to September, 1 of the 2009 year.

The Republic's banking sector has been presented by the 36 commercial banks, and the aggregate amount of the Kazakhstan banks delinquent credits has been made up 8,2 bln. dollars, or 9,9%, by the estimate for September, 1 of the 2008 year.

By the most optimistic assessments, the loans share, having subjected to the stress, is equal to 35 – 40%, by the S&P agency valuation. The «Kazcommrcebank» has the delinquent credits for 2,8 bln. dollars, the «BTA Bank» — has 1,26 bln. dollars, the «Alliance Bank» — has 725 mln. dollars, the «ATF Bank» — 700 mln. dollars.

In Kazakhstan, the money supply has been decreased for 4,7% down to 5.970,4 bln. tenge during January of the 2009 year, at the expense of the lowering, as the banking system net external wealth, well as the internal assets decrease, as it was indicated in the Republic of Kazakhstan (RK) National Bank report (e.g. RK NB).

So, the RK NB clean international reserves have already been increased in the structure of the banking system clean external wealth in January of the 2009 year, in comparison with December of the 2008 year, while the banks clean external wealth have been decreased.

The main requirements have already been decreased, as to the Government, well as to the other economy sectors, in the structure of the banking system internal assets, as it was mentioned in the report. By the RK NB data, the effective money in the circulation have been decreased for 16,8% down to 714,1 bln. tenge for the reported month.

«This decrease is appeared to be, historically, the biggest monthly lowering, as in the absolute, well as in the relative expression», — it is mentioned in the report. Moreover, it is being explained in the report, that the cash foreign currency exchange offices sale has been become the considerable reason of the cash tenge lowering in the circulation, besides the traditional seasonal their volume decrease in January, in comparison with December [4, p. 37].

At present, Kazakhstan is trying to struggle with the challenges whole wave. One from them is the downturn in the prices for the main export commodities (and, in particular, the price for the oil from 150 down to 40 dollars for the barrel), having formed more, than 60% of the export. So, the downturn in the prices is being threatened Kazakhstan with the red ink formation by the trade balance (e.g. for the first time, since the 2000 year) and with the current operations account. Thus, having considered the commercial banks forthcoming large payings off by the external commitments, on the whole, the high level risk is present of the Kazakhstan negative purchasing balance formation and also the country's international resources reduction. As it will be seen further, this challenge solution is appeared the paramount and the vital important task for the state [5, p. 7].

Then, the second challenge is appeared to be the national currencies weakening by the Kazakhstan main commercial partners, as the result of this, the domestic production has been become the «Tengry Finance» Joint – Stock Company (JSC) to be experienced the price pressure from the side of the import production in the Republic. Everything is being redoubled and aggravated by the fact, that Kazakhstan is not quite able to carry out the reciprocal devaluation at the necessary level, as it is being to be obliged to take into consideration the credits' high rate of interest, having given out in the foreign currency inside the country (e.g. about 50%). On the whole, it has not been suffice for the price advantage removal at the importers, though Kazakhstan, in the beginning of February of the 2009 year, however, has weaken the tenge's course from 122 up to 150 tenge for the dollar. That is why, this, correspondingly, also is left its negative mark on the stabilization policy, which the country is being carried out at present.

During the last one and a half year (e.g. in the crisis period), the international credit rating agencies, repeatedly, have been lowering the country and the commercial banks sovereign ratings, in response to the Kazakhstan macroeconomic indicators and the national measures worsening, that has been outlined one more the challenge.

So, the ratings lowering process has not yet been completed, and at present, the Kazakhstan long – term ratings transition in the foreign currency just from the investment group into the speculative one and, correspondingly, the corporations ratings proportional lowering are the real threat. There is no doubt, that this would have negatively an impact upon the banks debt capability, and it would be resulted in the next foreign capital outflow and in the investment projects realization slowdown on the Republic's territory [5, p. 10].

That is why, Kazakhstan, having made those or other decisions, has been obliged to be preserved the necessary parity between the banking sector and the other economy sectors.

In whole, in our opinion, the state has been succeeded to make this, if to look at this, exclusively, from the current stability advancement position at the Kazakhstan financial and the economic market, but, for all this, the long – term growth to be excluded. All the mechanisms, having involved to be worked by Kazakhstan, in a measure, are being reflected the country's hope for the crisis quick completion and the banks capability restoration to attract the capital at the international financial markets.

Kazakhstan has decided to support the banking sector from the National fund (e.g. 1.200 bln. tenge), the storage pensionary system (e.g. 480 bln. tenge), and the budget means, and the country has also provided the necessary stimuli for its economy, including the fiscal ones in the framework of the crisis management program.

However, from all the measures, having involved to be worked by the state, first of all, we want to be drawn the attention, in particular, to the Kazakhstan concern in the foreign "players" involvement in the banking market. At present, it is quite known, that Kazakhstan is conducting the negotiations with the large Russian banks on the state control packet of shares sale in the «BTA Bank».

In the end, the state power representatives, not once, have already declared, that the state is not intended to be held the banks purchased holding of shares more than 60 months (e.g. 5 years). At the same time, we consider this solution is the correct one, and we draw attention to the fact, that Kazakhstan will give the preference to the foreign banks in the investors' choice.

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Materials of Conferences

RUSSIA IN THE ASIAN – PACIFIC REGION: THE SCIENTIFIC AND TECHNICAL POLICY'S ACTIVIZATION NECESSITY

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The world economy and the policy new center is being formed in the Asian – Pacific Region **(**APR), which begins, noticeably, to be taken the lead over the European Union, by its scales. More than 60 percent of the world gross domestic product (GDP) is being fallen on the APR share. This region is the largest world powers interests' zone – such as, the USA, China, Russia, Japan, and India.

So, it is quite possible to be singled out the two states groups inside the APR. The first group: China, Japan, the Republic of Korea – they are the economic leaders. The rest countries – are Mongolia, DPRC (Democratic People's Republic of China) and Russia, in the first place, its the Far East and the Transbaikalia, – into this region backward periphery.

If the considerable sudden change has been taken its place during the last decade years in the first group's countries at the economic development level, then the Russian Far Eastern region has been appeared to be in the degraded region situation, because of the insufficient centralized investments of the capital, the unreasonable transport tariff policy, the social and the economic sphere underdevelopment and the non – densely population.

It is necessary to be changed the Far Eastern region economy on the innovative development way in order, that not to be turned into the APR countries raw materials appendage. And at that, the innovations, the new technologies will have to be directed not only at internal traditional economy raw materials sector, but and at the Far Eastern processing branches of the industry stimulation and the further development. Simultaneously, it is very significant to be begun the leading, the science intensive and, at the same time, comparatively inexpensive Russian technologies expansion into the APR countries. Thus, the Russian engineers, the scientists, and the scholars are quite able to suggest the scientific and the technical developments in the field of the energetics, the space and the informational technologies, which owing to their relative cheapness and the high level efficiency, have their high competitive potential.

So, the Far Eastern Russian science higher educational sector is quite able to become one from the Russian scientific and the technical expansion conductors in the APR. At present, more than five decades of the Institutes of the Higher Education, the Colleges, and the Universities are being functioned, among them it is necessary to be singled out the Vladivostok, the Khabarovsk and the Komsomolsk – on – the Amur Technological Universities, having had the considerable groundwork and the work already done in their participation in the field of the energetics and the machine building in the Far Eastern region.

The indicated groundwork and the work already done in their participation would be able to be required and collected at the APR countries intellectual property market. However, the high educational sector structures activity inefficiency, their chronic underfunding and the work experience drawback at the intellectual property market are not quite being promoted to the licences successful realization for the rights use on the patents and the know – how.

So, the scientific component in the Institutes of Higher Education, the Colleges, and the Universities activity in the Far Eastern region has been become still more modest, as by the unit weight in the Institute of Higher Education, the College, and the University budget, well as by the achieved results level. Particularly, it has been become the obvious fact against the background of the dynamically developing Institutes of the Higher Education, the Colleges, and the Universities of the neighboring China.

The State Council of China has taken its decision, additionally, to be allocated about five billions dollars for the scientific researches in the middle of May in the 2009 year. The gross exposure, having been the share of the research engineering works, will be reached 70 and more percents in the Chinese leading Institutes of the Higher Education, the Colleges, and the Universities budget. For the reference, such gross exposure in the best Russian Institutes of the Higher Education, the Colleges, and the Universities budget are the share of the learning activity, but not for the scientific work and the corresponding scientific effort.

The incomes absence from their own scientific and technical developments sale is being stimulated, neither the higher educational management, nor the creative forces and the corresponding personnel for the scientific activity activization. Consequently, the situation is being made up, when many Institutes of the Higher Education, the Colleges, and the Universities are not quite able to be entered into the self – financing regime at the rights maintenance and their supporting for the own intellectual property. Thus, the Institutes of the Higher Education, the Colleges, and the Universities are being stopped to be the patents overwhelming majority owners for their own inventions already during the 2-nd or the 3-rd year after their receiving. The things being, as they are none scientific and technical expansion at the APR countries intellectual property market, certainly, is quite impossible, from the Russia's side.

So far, the 75% Chinese Institutes of the Higher Education, the Colleges, and the Universities have not yet gotten even one patent for the invention,

by the Chzheczyansky Industrial Institute data. But, still. And the outlined tendencies and, the principle aspect, as the financing scale, well as the organizing activity and the corresponding efforts have already been permitted to be forecasted the Chinese Institutes of the Higher Education, the Colleges, and the Universities positions considerable strengthening in the field of the scientific and technical activities already in the near future.

Thus, it is getting quite evident, that, at first, the Russian economic, and afterwards and the political independence in the APR region would be completely lost without the scientific and technical policy considerable activization, as all the country, well as the Far Eastern region.

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NEW QUALITY OF ADDITIONAL TECHNICAL EDUCATION (FROM THE WORK EXPERIENCE OF NON-STATE EDUCATIONAL ESTABLISHMENT "INTERSECTORAL INSTITUTE", UFA)

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A concept of education as a social institution can be traced in all major educational documents of UNESCO. In particular, we mean the recommendations of International commission of education in XXI century, which described four global goals of education:

1 – learn to produce (economic function);

2 – learn to train (cultural-constructive function);

3 – learn to coexist (social function);

4 – learn to follow the healthy way of life in its physical and moral definition (valeological function).

In the "Major areas of social and economic policy of the Government of the Russian Federation in the long-term perspective", section 1, "The reforming of education" (2000) the necessity of the development of continuous additional professional education is stated. This is explained by objective process of the obsolescence of knowledge and by the necessity of flexible and operative reaction to the new labour-market requirements for new knowledge, skills and relations.

In order to accomplish the successful professional activity in the new conditions the retraining and professional development of app. 20 million managers, specialists and state employees is required. To solve this problem it is not only needed to increase the bandwidth of the operating system of additional education by 300-400% but also significantly increase the quality of staff, the quality of professorial and teaching structure of the additional professional education system workers.

Non-state educational establishment "Intersectoral Institute" began its development in the early 1990s from changing the production relations within the organization:

- the working process of the organization was determined not only by orders and directions of the higher agencies of education supervision and control, but, first of all, by needs of specialists of the industrial productions within this type of educational activity in the market of educational services;

- worker's salary was defined by work. As a percent of the implemented educational program by the tutor, master of production training, manager, who is responsible for training and graduation, income, for example. Or as a percent of the education institution income in whole – for the leader of the institution.

- the responsibility for training one group of students was given to one person: tutor, master of production training, not to the whole team of subject tutors. The same person is in charge of the payroll for the implementation of training program within a student group.

Thus, the production relations within the education institution were transformed from the state relations into the democratic, market relations.

Education programmes and technologies of their implementation within the training process of the education institution were changed in comparison with those of the state educational institutions that all have one goal – give students that knowledge, abilities and skills that are defined by governmental authorities as necessary ones.

The goals of new programmes and technologies are:

- firstly, help studying specialists obtain new or improve their professional competence in their specific professional area (activity professionalism, personality professionalism and self-efficiency) in the most efficient way;

- secondly, help managers and owners of the industrial enterprises and organizations to create and actualize professional qualification staff structure in the most efficient way.

After the primary analysis of the condition of industrial sectors of our country's economy of the late 80-es and early 90-es we came to a conclusion, that the reason of their breakdown and stop was their lag from the development of scientific and technical progress. The main reason of this process was the lag in the professional education of production specialists (approximately for 2-3 generations).

First educational programmes of industrial enterprise workers training were aimed, generally, to teach those specialists to learn within the educational

institute. Before that the knowledge, abilities and skills, needed for work were usually obtained by self-education. The skills of working "behind the desk" were forgotten by many. Since that, at the beginning the educational programmes for technical specialists were developed as a target courses aimed for studying one relatively small regulatory or technical document, Federal law or Rules or all-Union State Standard. Besides, the requirements of State technical supervisory authorities were often used as a motivation.

After that educational programmes of training specialists to solve new professional problems in the area of production safety, new technologies, economy, the efficiency of working process rise, production culture etc. were developed and implemented according to the requirements of the position and the work place of employee.

Nowadays new person-aimed educational programmes of advanced training and professional retraining of specialists according to their position or profession are developed within our institution.

We see further prospects of the development of educational programmes of the institutions of additional technical and professional education first of all in the corporate direction, which is training of the enterprise staff according to requirements of their inner technical regulations. Secondly, the training plans and programmes will be aimed for persistent education. That means that approximately 20-25% of working time industrial enterprises specialists will work and train within the additional technical and professional education institutions following the fixed schedule for a year (five, ten years, all their life) according to single prevailing plans and programmes.

New educational programmes define new methods of organization of the educational process, and, besides, new quality of work, new structure ad new content of educational institution. Hence the new system of educational institution quality management is exposed.

Nowadays State educational regulatory and methodical documents (State education standards) are used as some kind of recommendations within the system of non-state educational institutions of additional professional technical education

The study of basic documents of professional technical education for the period of the last quarter-century and the analysis of measures, carried out within the system of additional professional education according to regulations made by these documents, show us that the substance and the mechanisms of the education improvement and management processes are studied quite well. Logics and mechanisms of the education development are not studied enough for using it in practice yet. At present, additional professional technical education is in the process of development.

The problem of the development of successive educational programmes and corresponding educational standards within the system of additional professional education of industrial enterprises specialists training stays the subject of serious scientific discussions nowadays. Te ways of qualitative changes of the educational substance, forms, and methods within the educational institutions of additional professional technical education are seen by many researchers in a person-aimed training implemented by methods, pertaining to the humanities. That assumes that the process appeals to the presented individual system of the listener's professional models, the person's involvement in the person-aimed educational situations. Thus, the transformation of the education within institutions of additional education from person-estranged to person-aimed is not a technological measure, but a valuable one. From the position of humanist-system approach that means the bridge from the artificial, target-aimed educational system, to the value-aimed system pertaining to the humanities.

New educational programmes created the necessity of new educational institution form, within which the professional qualification personnel structure has new professional qualification qualities, different from those of academic institute of higher education. The work of tutors, methodologists, managers acquires an absolutely different nature by form, technologies and requirements. For example, a good tutor of additional professional technical educational system besides the skill of qualified exposition of his knowledge must also know how to pull the knowledge from the listeners, create a single informational and educational space according to the audience's level in order to provide the experience exchange and set the direction of the discussion, structure and summarize the regulations made by specialists, understand the specific situations, offered by listeners, answer to the practical questions.

Methodologist does not only adapt standard or type educational programmes to the conditions of education process within the institution and the customer's requirements, but also enrich it with new content, develops new forms and methods of their implementation. Since the number of developed, studied, affirmed, and coordinated educational programmes throughout the year is very big (more than 400), a powerful methodological department that is much bigger than those of state institutes was created within the Non-state Educational Establishment "Intersectoral Institute". Almost all programmes are author and require even more serious methodological work.

In a non-state educational institution of additional professional technical education the work of training and organization marketing service also acquires significance. High professional qualification qualities of methodological and education-organizing marketing service workers provide firmness and stability of the whole institution workflow.

Functional duties of professor and tutor personnel of non-state educational establishment acquire form

different of those of a state institution. Besides the major specialist and methodist work a tutor must carry out management and marketing of his education services.

The non-state institution of additional professional technical education management must have absolutely different goals, forms, criterions because the institute work quality level is not defined by state executive authorities, but by the representatives of customer enterprises or natural persons, and that means, that they also define the activity goals within the educational services market. Accordingly, depending on new formulated goals new planning, function, control and educational institution management must be organized.

Today our educational programmes of additional professional training correspond to the nowadays requirements. They are in demand within the educational services market. Their implementation causes difficulties, origins of which we see in an imperfection of education programmes of academic educational institutions, and particularly secondary school.

Scientific methodological work within the system of non-state additional professional technical education is aimed for development and improvement of technological realization of industrial enterprises specialists professional retraining and further training programmes.

The technology of the education programmes development and methods of their realization within the tutorial process of state educational institutions are different from those of non-state educational institutions in the area of process targeting: the former are based on the technology of how to teach, the latest – what to teach.

In conclusion we would like to say that if we seriously want to create a functional system of additional professional technical education, we don't have to rebuild our old professional education and get carried away by innovations, but create it in a new fashion.

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WORKS OF ART AND VISUAL THINKING

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Visual thinking is a type of non-verbal thinking. It has been extensively studied by psychologists in recent years. Many psychologists believe that the main function of visual thinking is its ability to coordinate different meanings of images into a complete, visible picture. The article examines visual thinking in arts via structure of an art work. A painting will be taken as an example for this purpose, though results of this research may be extrapolated on other kinds of arts.

Keywords: visual thinking, image, visual essence

Visual thinking helps us to ontologize results of abstract-verbal thinking; by means of it an abstract essence becomes intellectually visible. It is necessary to stress, that visual thinking is a contentive product of synthesis of previous sensual experiences and abstract-verbal thinking; by means of it an abstract essence becomes intellectually visible. Visual thinking is a constructive product of synthesis of previous sensual experiences and abstract-verbal activity. So a sensual component of an image of visual thinking is not just the same as some direct sense-data. This component is radically changed within a visual-rational image; it reflects those objective structure, which are not given in a direct perception. An image of visual thinking is able to foresee future events, to draw future worlds in forms of designer's projects.

Images, expressed by works of pictorial art, are not merely perceptual copies of external objects. They are literary *Visual Essences,* lighted through a prism of human relation towards them. Several aspects of this relation are described inE.Bullouglrs conception of Psychical Distance[1], J. Stotaitz's theory of 'Disinterested Relation', V. Aldrich's notion 'Seeing as'. Much may be said about historical discussion between two alternative sets of theories of art - among a theory of *imitation* and a theory of *expression,* which were developed in modern aesthetics by Clive Bell, Susanna Langer, R.W. Collingwood, Morris Weitz, Monroe Beardsley and others. A good critical analysis of these theories one may find in a very interesting monograph of George Dicke (Aesthetics. An introduction. Pegasus, 1971. - 200 p.). But if Dicke analyze imitationism and expressionism as simply different alternative theories, we want to unite them dialectically as descriptions of polar sides of the same pictorial process.

There are two sides of a work of pictorial art, mutually tied. The first side we call *naturalistic tendency,* the second — *symbolistic tendency.* Proportions of these tenden-cies are very different in various art works. According to his philosophical and artistic program a painter may prefer one tendency more than another, consequently one painter may be called, in general, *naturalist,* another - *symbolist.* Still two aspects of a picture, naturalistic and symbolistic, are its attributes. In order to communicate with a painter, a spectator must recognize, more or less, natural-geometric forms and shapes of a painted artistic object. So the first plan of an art work (its surface) is a naturalistic (imitationistic) key, by means of which one can enter into an author's intention, conception. Some historical and conditional details are helpful for this purpose, especially when a spectator has a good artistic experience and taste. But a real work of art has some other levels, situated within its inner plans. The more profound an artist is, the more number of these levels one can find in his picture. These levels express symbolically author's artistic conception of a human relationship towards the world, towards different aspects of reality. Author's and spectator's visual thinking starts on these levels.

Many inexperienced people do not know about such a complex structure of serious artistic works. Their glances are slipping along a surface of a master-piece, though even in this case primitive feelings of aesthetical pleasure do appear. It is true that there are many professional art critics who,

also, are able to describe the first sur-face plan of an art work only; much is to be done to educate aesthetically those people, especially those critics, who assure public, that an artist usually does not know what he creates, that an artist creates mostly unconsciously or subconsciously. It is true that often an artist is not able to retell painted contents by means of words. But it happens, we believe, not because of his non-rationality or irrationality. A real painter creates by means of visual thinking primarily, but not with the help of verbal thinking. A verbal name of his picture is only n prompting, not necessarily a true one, how to enter to the bottom of his divisionally rational construction.

When an artist starts his work he, may be, does not know his final rational result. But if he finishes his work successfully and does not want to deceive spectators, he mostly consciously knows this result. Of course, it does not mean that an artwork is a closed system. This system is open for a private spectator's imagination, and sometimes one can discover even those deep levels of a talented art work, which its painter did not realize. Thus, art develops in different directions as a result of mutual penetration, balance and unbalance of naturalistic and symbolistic tendencies. Masterpieces are historical landmarks of this dialectical process. We think, that a real pictorial masterpiece is a pure balance and harmony of naturalistic and symbolistic sides of a picture, so some deep essence is expressed geometrically and colourfully in a very naturalistic-realistic manner.

The second condition of a masterpiece is a visual expression of some deep philosophical idea, which is out of age, eternal and international humanistic. Such masterpieces survive via centuries and are open always for new modern interpretations. We think that a good public artistic education is to be based on a written history of such masterpieces, around which other historical one-sided attempts to develop various mode of naturalism and symbolism may be centralized. This is an idea of a new short and condensed course of history of arts with a causal explanation of arts' process.

Now we want to illustrate and to prove just a little this sketched conception of visual thinking in arts. We have no place now to deepen into a description of a nature of a childish picture. We would say only, that little children have to solve an extremely hard problem, when they try to understand adults' notions. Children see ordinary things (tables, chairs, animals, etc.) approximately as we adults do. But adults use words to designate classes of things, i.e. essences, and little children do not understand, why, for example, a word "table' may express in one case a four-legged table, in other case - a table with one leg only and so on? A child has to build rational images of sensually perceived things himself. And this is a real personal creativity.

Accordingly to the psychological theory of interiorization, a child must firstly exteriorize his conjecture about invisible essence and materialize it in a visible geometry. A childish picture is an example of this exteriorization. It is wonderful

that pic-tures of all children in the world are similar, there is just the same geometorical alphabet in those pictures, it is amazing how little children of different nationalities can read and understand pictures of each other easily, but many adults do not understand them. Adults falsely see in that pictures sensual naturalistic copies of external individual things, but not *Visible Essence,* sketches of notions. Adults are mistaken when they try to correct childish pictures in order to make them similar to ordinary physical things. The symbolical side is the main parameter of such a picture.

When a child has solved his conceptional problem he usually stops his further painting, does not want to improve it. Some of more eldest children continue to draw, and their pictures become more naturalistic. It is very significant that great artists sometimes want to return back to a childish manner of drawing to express essences very geometrtcally-economically. Picasso was amongthem. You can see, below, several examples of a

childish drawing of essences, A child draws his *notion* as a logical circle in the middle of a list of paper, and a background is meaningful for him as *all others things around.* Do not insist, that a child simply waste paper. He concretize the logical circle while drawing some details which, he believes, are essential. For instance, 'a cat' is a circle with several short lines within it and with schematic nails. It is because of cat's wooly soft hair and dangerous scratching nails a child has firstly a notion (essence) of each cat.

Look at the second picture. How economically a childish understanding of a notion "door-keeper' is symbolically expressed in it! You see a one-handed 'head-legger' with a spade. The third picture clearly expresses a personal childish attitude towards such a life-meaningful object for a child as his parents' behaviour. You see the author in the comer, he has no hands to give them to his parents, who have also no hands for the author and who love only author's brother (or sister). Thus, the symbolical side of visual thinking in arts one may trace to begin from childish attempts to draw essences. And this side determinates the other, naturalistic one. In adult's art these sides can change their force, periodically overweighing each other during Art history.

Now let us offer you explanations of several great art masterpieces from the point of view of two correlated tendencies, naturalistic and symbolistic. 'Diskoflingerr of ancient Greek sculpturer Miron is well known. But a few people can see in this sculpture not simply a sportsman, but a visible essence of Apollo - the god of peace and war. Miron expressed geometrically in his work the harmonica! theory of Heraclitus, the philosophy of symmetry of peace and war forces, which are in a mutual struggle eternally. Natural lines of a human figure are subordinated to the main idea of antique dialectics. Lines of hands, shoulders and so on are the mental key to recognize a bow and an arrow in a battle position. Just the same lines with additional of a head and some other body lines are embodied an ancient Greek lyre, a musical instrument of a silver-bow god Appolo.

Contemporaries of Heraclitus and Miron did understand this visual rational image because they were accustomed to a mythological kind of thinking and highly experienced in arts. But modern people mostly see ш this sculpture only a physical body, and art critics notice in it many mistakes from the point of view of anatomy of a hu-man body. Miron's 'Diskofiinger is an eternal masterpiece, which visually expressed a great idea in a very laconical and perfect geometrical form. Who can prove that Miron did not know what he creates, consciously!

Look at the two pictures of V.T. Surikov — on 'Countess Mororova' and 'Stepan Razin'. Naturalisticafly they are very different, but symbolically they are identical. Surikov was influenced too much by the widely spread (in Russian society in the very end of the 19-th) idea of a lonely strong hero, who knows that he will die and still goes against the modem life stream. To express this idea Surikov invented a special geometrical scheme, which determines a whole set of his brilliant pictures. This is a scheme of a triangle against element. The hero-triangle induces a turbulent movement within a laminar}' normal stream of life. An active diagonal line across Surikov's pictures is drawn in such a way that it expresses the inevitable defeat of the hero. Countess Morozova, one of the leaders of old Russian Orthodox Church, died in exile. Thus, under a surface of Surikov' different pictures you can find a more deep level of a geometrically expressed essence.

A.A. Ivanov's masterpiece "Christ's advent to people' (1837-1857) is well-known in each country. But even eminent art critics can not explain its main idea. They qualify it as a marvelous eclectical picture, they ar unable to find its geometrical-meaningful centre, to name the main figure. Some of them think that Christ or John may be that figure. It is wrong. Ivanov as influenced by philosophy of Shelling and his main artistic idea was the idea of an artist who may be the only one human measure of truth and faith. And the

very imperceptible figure on his picture is the central figure in a modern clothes and with a european hat (among others in ancient clothes). And this figure is Ivanov himself!

Usually God's space and man's earth are drawn in religious icons in a form of a numeral 'eight,' '8\ It is a sign of indefinity, which is standing vertically. God's Son. Christ, is the middle of this figure. Christ unites God's and man's worlds, Ivanov puts '8' horizontally. The painter himself now in the role of Christ, he unites and mediates two opposite worlds - the world of faith and the world of truth (knowledge). In the first circle you see pupils of Christ, in the opposite circle-non-believers ('book-people' and pharisaioi). If the first are surrounded by green life's colour, the seconds are situated in a desert. Christ appears on the side of unbelievers because he is more important for them. But you also can see in the left corner of the picture a Jerusalem temple and a *yellow* twig of the green tree upon the temple. It means that Christ's doctrine ('twig') begins weakening, and Christ's apparition is necessarily for his pupils also.

All figures are very naturalistic (realistic), as if you see a photo of a real event. But the naturalistic side of the picture is totally subordinated to the author's conception of a true artist. The artist here is shown as the middle of a weighing machine, on which *faith* and *knowledge* are weighed. Christ is a light unbalanced force on the side of *knowledge*, and yellow twig is a counter force. So the balance is restored again, and the picture seems to be highly harmonical. The more you deepen into Ivanov's picture, into bottom levels of its structure, the more you understand, by means of your visual thinking, the author's conception. You are able to understand that Ivanov found the golden medium among faith and knowledge, and different figures on his picture, young and old, delighted and skeptical, etc., are nothing else but images of ivanov's personal biography. These figures are symbols of his own creative life way; the cen-tral figure is symbolized his found meaning of life. Much is to be said about Ivanov's skill to harmonize oppositions on each part of his work.

The more general artistic idea, the more abstract may be its visual geometric expression. The top of this visual thinking in pictorial art was achieved, we suggest, by Kazimir Malevitch in his suprematism (in his art of pure forms). His 'Black Square' is the more abstract painting out of possible. As Malevitch himself wrote in his explana-tions, this work artistically expressed the Hegelian dialectics of pure existence and nothingness. At first a spectator's existence is situated on a white background of the canvas. Then a spectator is pulled in the blackness of the square, into its infinity; it is difficult to return back on the white surface of phenomenon. Such is a pulsation of life and death and a pulsation of a spectator's attention. Impressive people are better not to survive aesthetically 'Black Square'. Many artists and ait critics hate this masterpiece. Even if they do not understand its idea, they nevertheless feel that Malevitch revealed in a naked form *absolute,* which is cold and dangerous for normal people. Two sides of each great artistic pictures -naturalistic and symbolistic - are perfectly identical in 'Black Square' accordingly to the top level of artistic material and abstraction. Thus every great master finds his own original form of visual thinking and materializes this form in an art masterpiece, eternally alive.

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PHILOSOPHY AND PHILOLOGY

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A question about relations of Philosophy and philology is discursive. No mere chance, discussions have become important in contemporary Russia: some very important peculiarities of intellectual life are brightly reflected in them. Even conversation partners with very good characteristics and very interested in results from the conversation, more often than not reach mutual understanding.

As philology is a universal text about texts and philosophy is a universal impulse: it rests on a text as on primary material, but with that comes out of the boundaries of textual.

It comes this way: philosophy once forced out philology into life. In other words, philosophy, which initially has been oral, forced text as something unfamiliar- from its boundaries and thereby gave philology freedom to independent development.

But philology soon forgot what it owes to philosophy and began describing all text as its own. And philosophy coming out of oral stage and needing to nail down the results of its work, suddenly recollected of this once gifted free rein, but knocked together with already strengthened friend- enemy.

We may say that fight between philology and philosophy is dateless.

Philology, from philosophers' point of view, is non-topical within the meaning because it's impossible as philology of the present. It's because it turns the experienced events of reading into historic documents, dead thing. It is even impossible to say whether philology is right or not, from philosophers' point of view: it merely has no relation to those important for contemporary culture texts, which are "meaningless", but bring in themselves vitality boost. Whereby their own reading technique philosophers do not show, saying it has no relation to language, they proclaim principles of "direct" reading, which appeal to show up communicative strategy of the writing.

There are interesting judgments from Gasparov – classical positivism, Merlo- Ponti – issue of body and perception, Valery – philosophy as literature, Fuko- power – knowledge and etc.

Philosophy rescue is philology made practice.

So, in philologists' and philosophers'' discussions, philosophers were mostly interested in encoding of sensitive gaps.

New basic structures of space and time perception which at the root of any experience are to be formed.

Thus, we raise a question of philosophy and philology balance not to compare pre-defined roles or social prestige of the disciplines. This is a question of mutual complememntarity in culture.

It is a dream of the whole science world that there's no disagreements between philosophy and philology.

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Materials of Conferences

THE PRIMARY GRADES TEACHERS PROFESSIONAL QUALIFICATIONS, AS THE PSYCHOCOMFORTABLE MEDIUM CREATION EFFICIENT CONDITION FOR THE SCHOOLCHILDREN PERSONALITY DEVELOPMENT

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The serious deviances and the changes in the children mental and the psychical development are being taken their place in the junior school age under the teaching influence.

At this time, the moral behavior basis is being laid, the moral norms and the code of behavior learning and mastering is being taken their place, the personality social direction and the orientation is begun to be formed. The junior schoolchildren temperament suitability manifestations are quite able to be distinguished by their discrepancy and the instability. In this connection, the temporary mental and the psychical states are quite to be accepted sometimes for the traits of the character.

So, in the school, the interests, especially the cognitive interest to the world around knowledge and the cognition, the keen intention to be known much more, the intellectual desire for the further learning are very noticeably being developed during the first learning years. The feeling and the emotional experience have the great significance by the schoolchild of his successes and the accomplishments in the teaching, which are being defined, in particular, by the teacher's corresponding control and the grade [1].

Exactly, therefore, the elementary forms and the primary grades teacher is necessary to be orientated and to be directed towards the junior schoolchildren psychical, the mental and the physical development regularities for the more comfortable medium creation of the children personality formation. So, the teacher himself professional qualifications are being played here the role of no small significance.

Thus, the competence is being defined, as «the specific ability, which is necessary for the specific action efficient fulfillment, in the specific object activity, and it is being included the highly tailored knowledge, the object skills, the manners of thought special sort, and also the responsibility comprehension for his actions» (G. Raven) [3].

Lukyanova M.E., under the teacher's psycho-educational competence, understands the personality defined and the specified qualities (e.g. the properties) totality with high level of the professional qualifications to the pedagogical activity and to the efficient interaction with the schoolchildren in the educational process. So, she is considering the psycho – educational orientation and the direction blocks, as the psycho – educational qualifications components [2].

His theoretical and the practical preparedness unity to the pedagogical activity realization is being understood, under the teacher's professional qualifications by Sorokina T.M. So, the competence is being considered, as one from the professionalism stages, having made up the teacher's pedagogical activity basis. Thus, the teacher's professional qualifications are being interpreted, as the personality ability to be solved, as the different pedagogical, well as the various educational tasks types at the diverse level [5].

The pedagogical orientation and the educational direction interpretation by Sorokina T.M., as the teacher's grade school professional qualifications basis education, having consisted in, including it's the most significant characteristic, is «the orientation and the direction towards the child». The teacher's pedagogical orientation and the educational direction towards the child is being pursued its object not only for him the psycho-comfortable conditions creation for the personality further development, but and to be formed and also to be cultivated the learning motivation, the world around knowledge and the cognition, the people, and he himself at the schoolchild. It, moreover, is being assumed the concern on the child, the interest to him, the love, the assistance to his personality the further development, and also his individuality maximum self – actualization.

First of all, such specific pedagogical orientation and the educational direction in the psycho-comfortable conditions creation for the child personality further development at the grade school teacher is being revealed in the following:

a) The humanistic pedagogical and the educational world outlook peculiarities and the specific features, having permitted «the pedagogical and the educational space» system vital and the life activity organization and the direction for the junior schoolchildren to be carried out by such teacher. This system is being included in itself: the teacher and the play group interactions peculiarities and the specific features; the communication organization with the parent group and their own occupational self – perfection.

b) In the occupational integrative knowledge and the skills system, which are being realized through the teacher's flexible pedagogical and the educational thinking. The psychological knowledge, which «is being retained in itself» the main sense load of the grade school teacher's preparation process, his further occupational perfection is the teacher's integrative knowledge system pivot, as it is only quite to be realized at the psychological categories language, that is being happened with the child, in result of the object educational content influence, and also what kinds of the occupational preparation, for all this, the teacher will have to be demonstrated.

c) The personality's specific orientation and the direction «towards the child», having made up the grade school teacher's professional qualifications main content, is also being revealed in his managerial – diagnostically activity. The teacher's professional qualifications this aspect is being included in itself the following occupational activity:

- the analytical ones, having permitted the teacher to make the diagnosis of the junior schoolchildren development peculiarities and the specific features in the learning process by means of the educational content;

- the designing ones, by means of which the teacher – pedagogue is being projected the child development possible variants under the teacher's and the parents' teaching influences impact;

- the predictive ones, having given the teacher his possibility to be created the child development perspective programs (e.g. the developing targets) in the learning process, and also their own self – perfection programs.

Thus, the grade school teacher's «professional qualifications» category is being considered, as the collective notion, having defined the teacher's personality peculiarity and the specific feature, as the educator – teacher and the child psychologist in the psycho-comfortable conditions creation for his personality development. The teacher's conceptual acknowledgement of his pedagogical and the educational possibilities, the play group, the socium's peculiarity and the specific feature its development perspectives (e.g. social phenomena actual characteristics, the parents' group peculiarities and the specific features and etc.). Such conceptual acknowledgement is being defined the teacher's occupational flexibility in the selection (but not the copying!) of the pedagogical and the educational technologies, the methods, having permitted to be realized the main target – that is, the conditions for the junior schoolchild personality positive development to be created [4].

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PROFESSIONAL LABOR SOCIALIZATION OF A PERSON GROWS OUT EFFICIENCY OF INTEGRATION OF EDUCATIONAL STANDARDS

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It is experimentally proved that professional labor socialization of a person grows out efficiency of integration of educational standards.

Socialization of a person is the process of occurrence of an individual in the social environment, its mastering by skills of practical and theoretical activity, transformation of really existing attitudes to qualities of a person [1, 725]. Still Mudrik A.V. writes, that « the essence of socialization is presented as a combination of the adaptation and isolation of a person in the society » [2, 266]. We consider, that in a legal society a person live and work under his plan individually put by him in view of his interests, deposits, abilities and opportunities and in view of traditions and customs of the country where the person receives formation .When this all coincides successful conditions for effective professional-labor socialization of a person in the integrated international educational standards are created.

Socialization assumes active participation of a person in development of culture of human attitudes, in formation of the certain social norms, roles and functions, developing the skills necessary for his successful realization [2,725].

Studying the process of professional labor socialization of a person we measured before and after pedagogical experiment (out-of-class works: collective creative affairs, the psychological trainings focused on professional self-determination of students, discussion of industrial situations, debates) representations by satisfaction by their future trade by N.V.Kuzmina and A.A.Rean's technique. In sample participated: in control group - 15 persons, in experimental group - 15 persons too.

Factors influencing at choice of the future profession

Factors	Results of measurements in the control group			Results of measurements in the experimental group			Change of an experimental level concerning control
	The Significance value		Change of a level	The Significance value		Change of a level	
	Initial	Final		Initial й	Final		
1. A trade is one of the major in a society	-0,35	1	1,35	0,93	1	0,07	-1,28
2.Work with people	-0,14	1	1,14	0,93	0,93	0	-1,14
3. Work demands constant creativity	-0,50	-0,26	0,24	0,73	-0,51	-1,24	-1,48
4. Work does not cause tiredness	-0,50	-1	-0,50	-0,93	-0,86	0,07	0,57
5. Great wages	-0,80	-1	-0,2	-0,93	-0,93	0	0,2
6. An opportunity self-improvement	-0,14	0,86	1	-0,38	0,73	1,11	0,11
7. Work corresponds to one's abilities	1	0,86	-0,14	0,73	0,93	0,2	0,34
8. Work corresponds to one's character	-0,21	0,60	0,81	0,38	-0,38	-0,76	-1,57
9. A small working day	-0,64	-0,73	-0,09	-1	-0,43	0,57	0,66
10. Absence of frequent contact to people	-0,67	-1	-0,33	-1	-1	0	0,33
11. An opportunity to reach social recognition, respect	1	1	0	0,73	1	0,27	0,27
12. Other factors	De-velo-pment	Altruism	Happi-ness of others	Self-devel-opment	Dialogue, altruism	Happi-ness of others	Happi-ness of others

Thus, in the control group of students before experiment by significant factors 100 % of them have noted the 7th,11th points: work corresponds to abilities, reaching of social recognition and respect), and after experiment they chose the 1st, 2nd, 11th factors - their trade is one of the major in the society, they work with people, reach social recognition and respect.

At the same time in the experimental group before experiment by significant factors they have not noted any of the offered factors but after the pedagogical experiment the following points have been allocated: the 1st, 11th - the future trade is one of the major in the society; they will reach social recognition and respect.

So in the control group after the experiment the 6th, 7th, 8th factors (the opportunity of professional developing, work corresponds to person's abilities, work corresponds to one's character) had got the return importance but later they became positive.

And in the experimental group before the experiment the positively significant factors were the 1st,2nd,3d,7th,8th,11th - the chosen trade is one of the major in the society, they will work with people creatively, their work corresponds to their abilities and characters and they'll reach social recognition and respect. But after the pedagogical experiment the following points: the 2nd, 6th, 7th have been allocated especially significant – they'll work with people, they'll have opportunity of professional self-improvement, the work corresponds to one's abilities.

Thus the pedagogical experiment has shown that during the experiment there was the significant change of the experimental level concerning control one under the following factors: the 4th, 6th, 7th, 11th - work does not cause over fatigue, having the opportunity of professional self-improvement, the chosen work corresponds to abilities of respondents, the opportunity to reach social recognition, respect by means of the chosen profession. The difference of the level of importance under the 11th point - reach social recognition and respect, working in the chosen profession has made 0, 27 between the control and the experimental groups after the experiment. But the following important factor - «happiness of other people» has been added by all respondents as the control and the experimental groups. It shows that the experiment has changed professional values of students: Professional self-development, dialogue, altruism, the desire to benefit people, the organization, the native land, all people, and mankind as a whole have been allocated in addition.

By the results of the test it is visible that the technique has high validity in the sense that allows understanding and predicting the mechanism and results of professional-labor socialization of a person.

Thus during the pedagogical experiment conditions of effective professional-labor socialization of a person train have been confirmed: integration of all components of professional labor socialization of a person, correctional labor education, purposeful indoor and out-of-class work of labor orientation, the system of versatile additional formation focused on the international educational standards.

The carried out scientific research has shown that at continuous professional-labor socialization a person can effectively develop the professional creativity, diligence, bring economic advantage to the country that will lead to increase labor productivity, reception of greater profit by the enterprises, improvement of conditions of the scientific organization of work on places, creation of favorable psychological climate in labor collectives, growth of labor discipline, reduction of fluidity of manpower reserves, increase of own professional culture of a person, development of labor activity, business sociability, professional keenness of a worker at the decision of various industrial problems at globalization of the society.

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Materials of Conferences

SIMULATION MODELING OF INFORMATION SECURITY SYSTEMS

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The passage of our society from the post-industrial to informational caused such notion as information environment. Information environment is a subject's field of activity closely related to the creation, transformation and consumption of information. Information security provides the state of information environment protectability. In fact it means informational threat absence and as a result resistance of general human fields of activity to possible dangerous informational influences. Information environment as a fundamental factor of the social activity is a set of conjunct segments that include informational resources, hardware and software means. So comprehension of existing and potential threats to information security objects allows to provide an appropriate security system.

Any informational threat represents some input data, intended for activization of algorithms that break the normal mode of system's functioning in information environment. Separated research of information security threats according to single indices doesn't produce an expected affect, that's why it's necessary to reflect complexly all signs of measuring applying to each threat. As a consequence, it's necessary to use the simulation modeling for complex research of threats to information security.

Simulation models is a combination of traditional mathematical modeling with modern computer technologies. The maximum similarity between the model and real object, and achievement of the maximum exactness of it's description is the purpose of simulation models development.

Simulation models pretend to fulfill explanatory and prognostic functions.

The simulation models are realized by using building block concept that allows to divide the simulation system into several subsystems connected between each other by insignificant quantity of generalized interactions. This subsystems allow independent modeling with the usage of it's own mathematical tool. Such an attitude allows rather simple construction of new simulation models by changing of separated blocks.

So, as stated above, the resolving of problems of information security is based on:

- detailed quantitative analysis of the informational vulnerability in the informatization object;
- scientifically-based determination of the required security level of each object and under concrete conditions of it's functioning;
- creation of optimal security system;

The simulation modeling makes it possible.

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FRICTION LOSS ENHANCEMENT IN ELECTRIC DRIVEN PUMP OF SPACE VEHICLES

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Electric driven pumps (EDP) of low power (N≤300 W) provide circulation of fluid coolant at closed circuit of a temperature-control system (TCS) of space vehicles (SV). Reduction of energy consumption (EDP) is a relevant issue of SV temperature control rationalization.

Let's see the possibility of friction loss enhancement in EDP by way of example of a centrifugal electric driven pump. Let's analyze balance of loss in power in EPD power end not taking into consideration loss in its pump part (fig. 1, pos. I).

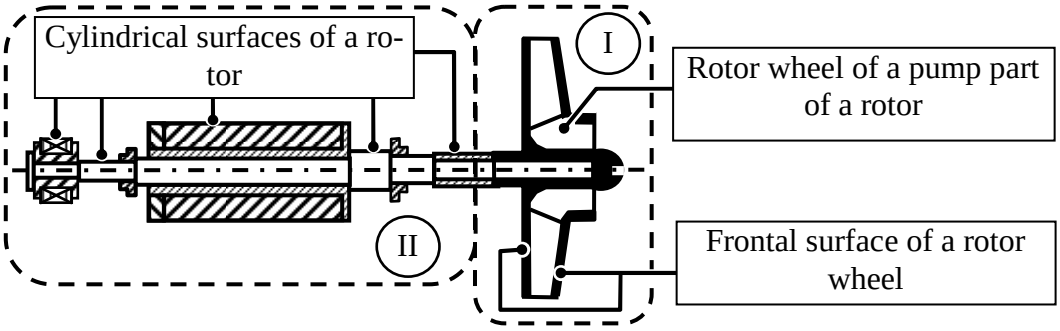

Fig. 1. Structure division of a EPD rotor:
I – pump part of a rotor; II – power end part of a rotor

Total power losses N_Σ in EDP electric drive come from several components:

$$N_\Sigma = N_{st} + N_{dr} + N_c + N_a,$$

where N_{st} - losses of steel anchor from hysteresis and whirling currents; N_{dr} - friction loss; N_c – loss in copper coil; N_a – added loss while load.

Stator and rotor of EPD SV power end are separated with a case that makes rotor immersion into heat-transfer fluid possible. Because of this rotor's friction loss upon heat-transfer $N_{dr.r}$, being part of friction loss becomes higher:

$$N_{dr} = N_{dr.b} + N_{dr.r},$$

where $N_{dr.b}$ – friction loss in bearings.

EPD SV refer to microsized supercharger in which diameter sizes of pump and power end parts of a rotor are comparable. Friction losses $N_{dr.r}$ on rotor depend on type of rotary surface and consist of 2 components: friction losses upon frontal surfaces of a rotor and friction losses upon cylindrical surfaces of a rotor. In EDP the first type of losses is dominating for a pump part, and the second type –for power end part of a rotor. For EP rotor construction rationalization it is necessary to estimate losses in power from friction upon pump $N_{dr.r}$ separately from power end rotor $N_{dr.r}$.

As an example, illustrating the opportunities of rotor construction optimization, let's analyze friction losses in EDP with electro engine DB-9 и characteristics: pressure H= 60J/kg; consumption of a heat-transfer agent $\dot{V}$ =140·10^{-6} m^3/s and rotating speed n=6000 r/min; clearance gap Δ=0.3·10^{-3} m; working medium viscosity ν=0.7·10^{-6} m^2/sec; working medium density ρ=691 kg/m^3 ; speed of fluid in a clearance gap between rotor and body v=15·10^{-6} m^3/sec. Calculated value of loss relative density in a pump part of a rotor, including element with the largest diameter – rotor wheel (RW), in the EDP will be $N^{p}_{dr.r} / N_{dr.r}$ =0.844. Thus, the most part of friction losses comes to the pump part of the rotor.

Dependance $\left(N_{dr.r}\right)_i \sim d^5_{pi}$, points at advisability of decreasing diameter rotor sizes, particularly diameter RW $d_{rw.}$. One of the constructive methods of decreasing diameter d_{rw} is transition to multistage EDP. Parameter consequence of this becomes coefficient of each stage specific speed n_s growth.

Let's look at the opportunities of decrease $N^{p}_{dr.r} / N_{dr.r}$ by increasing stages of EDP TCS to 2-3, considering that pressure coefficient of each stage will be unchanged , H=0.587.

While transition in EDP from 1 to 2 staged variant d_{rw} should decrease from 32·10^{-3} m to 23·10^{-3} m, and in 3 staged EDP to 19·10^{-3} m. Coefficient of special speed of a stage grows, respectively from n_s=67 to n_s =112 and n_s =152. Relative value of friction loss in a pump part of the rotor $N^{p}_{dr.r} / N_{dr.r}$ with growth of number of stages decreases to 0.677 in 2 staged variant of EDP and to 0.549 in 3-staged EDP, respectively 20% and 35% in comparison to initial level $N^{н}_{тр.р} / N_{тр.р}$ =0.844. Such changes of EDP are acceptable from technical point of view and positive from energetic point of view.

The viewed method of friction loss decrease upon rotor EDP is acceptable for different vaned light-duty machine, for instance compresses and ventilators of aero cosmic significance, radial sizes of rotor driving and force parts of which are comparable. Its realization allows decreasing friction loss upon rotor and decreasing power consumption.

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THE ROTOR-TYPE ARTIFICIAL HEART IMPROVEMENT WITH THE SPACE INSTRUMENT MAKING EXPERIENCE USE

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The American cardiosurgeon M. Debeiky has already described the rotor – type artificial heart structure (RTAH) in the following way[1]: "…this pump has the "Duracell" type ordinary electric battery size, and its efficiency – is 5 – 6 liters blood per a minute. There is only one motion part in the pump, which is called the impeller, and it is being made 10 thousands per a minute".

The RTAH is quite similar with the space rotor – type superchargers, having used in the space vehicles temperature control systems, by their hydraulic characteristics.

[1] The"Michael Debeiky Academitian: I rather like it more to be the ordinary physician, than the mature scientist" paper//The "Izvestiya" newspaper, No.72,it is dated from 19.04.2000, p.7, the last passage in the 1-st column.

At present, the RTAH designing analytical and calculating basis has been borrowed just from the industrial goods selling centrifugal pumps designing field. The design procedure is rich in a great number of the empirical coefficients and the factors, not having had their physical bases and the grounds, and it, moreover, is not quite being provided the best parameters achievement.

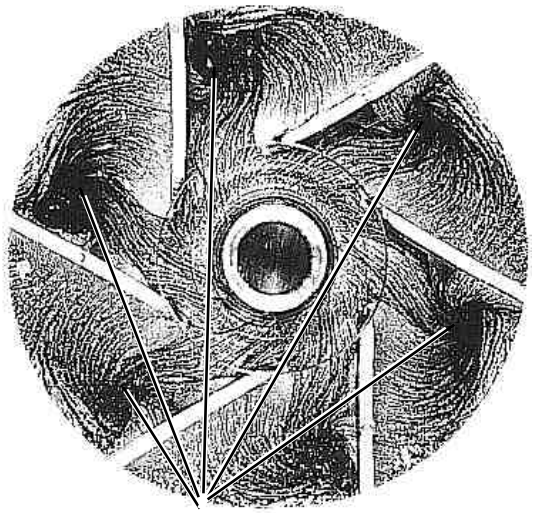
At the flowing in the impeller (which is the RTAH principal element), the flowing in the boundary layer has been become the dominating hydrodynamic factor, because of its diminutiveness. So, the used design procedures are being ignored this peculiarity and the specific feature, and also they are being provided the inefficient, from the power transmission mechanism point of view, the impeller flowing forms, having resulted in the efficiency factor lowering, the vortex formation process increase, and the energy flow pulsation component and the constituent part rise. The existing heart constructions sizes and the required power are being appeared to be the overestimated ones. The above – indicated shortcomings consequence are being become the following:

1. the device increased sizes and the weight;
2. the increased power consumption;
3. the underestimated resource (e.g. action period) for the power unit charging one cycle;
4. the construction overheating because of the increased radial sizes;
5. the impeller increased traumatic influence upon the blood structure, in which the blood clots are being appeared, having provoked the stroke and the heart attack onset.

It has been turned out historically in our country in such a way, that the main works in the dimunitive rotor – type superchargers field have been carried out in the space – rocket hardware. The technological perfection level, having achieved there, has been considerable exceeded the analogous ground and the terrestrial equipment indicators. The aerospace industry offset rotor – type superchargers are much more compact and smart, and also efficient, than the ground destination their analogues. The challenge is being consisted in the fact, that it is quite impossible mechanically to be turned out to transfer the space ingeneering and the space technology designing experience to the artificial organs field, as these devices operation conditions are being obtained the principal distinctions series.

In particular, the aerospace industry offset rotor – type superchargers must be sustained the heat carrier temperatures considerable drops. The tightened requirements and the raised standards on the anticavitation qualities are being made great demands to them, they must reliably to be worked under the zero gravity conditions. The supply voltage must not be beyond the 24 V…27 airborne voltage values limit. There is also the other specific requirements series to the aerospace industry offset devices.

Many requirements, having conditioned by the application space field, are not quite actual for the land – based pumps, and, at the same time, they are considerably influenced upon the rotor – type supercharger flowing part optimization scheme. That is why, it is quite reasonable to use the knowledge in the field of the flowing hydrodynamics, having received at the space technology and the space engineering making for the medical equipment and the artificial organs development.



The vortex formation zones
and the flow separation

Fig.1. The lines of the flow visualization on the impeller disk

In particular, it is necessary to be used the data on, that the local vortex structures are being appeared at the impeller miniaturization, having brought the considerable irregularity in the velocity field and the working substance pressures, having passed along the canals, see Fig.1. Consequently, the impeller deflecting characteristics are being lowered, the pressure qualities of the rotor – type artificial heart are being worsen, the construction radial sizes are being increased. One from the rotor – type application main advantages in the artificial blood circulation systems is being lost – that is, the minimum overall dimensions and the mass. If to be used the theory, on which the space pumps designing is being based on, then the above – indicated drawbacks are quite possible to be removed to the considerable extent.

Besides, it is quite possible substantially the impeller pressure qualities to be raised and, as the result of it, the rotor – type artificial heart to be designed more efficient in the operation, with less the impeller traumatic influence upon the blood.

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THE OPERATING REGIME INFLUENCE UPON THE AEROSPACE PURPOSE LOW-SIZED PUMP TYPE CHOICE

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The low – consumed hydraulic systems (LCHS) with the working substance pump feed have already been found their large – scale and the wide application in the aerospace purpose energy complexes. They usually use the liquid coolants, having circulated in the LCHS pipelines in the flying vehicles with the heat – generating equipment, having situated in the untight chambers, for the heat large quantity transmission on the isolated radiant heating surface, or the heat removal (heat supply) from the high power sources. So, the following pumps types are being used in them: the scapular – centrifugal and the vortex ones, and also the friction – disk pumps. The above – indicated types are being permitted the high – circulating electric drives application by the general industrial measures, that it is being promoted the construction dimensions decrease in the radial – circular plane. Their miniaturization is being provided the calculating operating regimes concordance possibility with the system hydraulic characteristics. The D_2 rotor wheels outer diameter is not exceeded $50 \cdot 10^{-3}$ m, in the range of n=(3…10) 10^3 rpm.

The centrifugal pump type has a number of its advantages inside of the low – sized pumps group. The main ones from them are the following:

● ***The Work Resource***.

The "Molniya" space vehicles (SV) have been become the first generation of the Soviet communications satellites. The temperature control system (TCS) in these SV has been carried out by the pump – circulation scheme. So, the preference has been given to the rotary gear pump at the pump type choice for the "Molniya" first model TCS (e.g. at the end of the 50 – es), by that time, it has been shown itself to a good advantage in the missiles steering engines composition. Thus, the TCS work resource of the first "Molniya" SV with the rotary gear pumps has been appeared to be inadmissibly low, in the process of its operations and the maintenance. Therefore, they have begun to employ the centrifugal pumps, having permitted to be increased the work resource up to several decades thousand hours in the all subsequent "Molniyakh".

● ***The Work Economy in the Regime Parameters Wide Range.***

The low – sized centrifugal pumps with the $\varphi \le 0.1$ discharge coefficient are being functioned with the efficiency acceptable level in the n_s=40…200 specific speed values range. This range is considerably narrower for the low – sized pumps another types**.** It is made up n_s=10…30 at the vortex pumps, and it is made up n_s=30…40 at the disk ones. The centrifugal pumps reasonable application field has been become dominating with the following number of revolutions increase up to n=10,000 rpm, for example, on the field of the temperature control (TC) LCHS needed regimes.

At the present day, the centrifugal low – sized pumps are the supercharger main type of the low – consumed hydraulic systems in the aviation and the space technology and the engineering, owing to better combination of the energy, the mass overall dimensions and the resource characteristics.

Let us consider the requirements to the centrifugal pump rotor wheel flowing form, having designed for the functioning in the temperature control LCHS with the following parameters: Δp_{hs} hydraulic resistance of the LCHS circulation tract is being changed in the range of Δp_{hs} =(0.03…0.2) Mpa, and the $\dot{V}$ working substance consumption is not exceeded $300 \cdot 10^{-6}$ m^3/s. Thus, we shall find out the n_s specific speed, having regulated the D_1/D_2 ration of the scapular pumps rotor wheel, having accepted all these indicators, as the pump's output parameters and, moreover, having taken into consideration, that the electric drives are being employed with the $\omega=(314...1047) \cdot c^{-1}$ angular frequency of the shaft revolution in the LCHS.

The n_s values bounds are being kept within the n_s= 40…80 values range, having satisfied all the really possible combinations of the working substance combustion and the LCHS circulation tract hydraulic resistance. The $n_s \le 80$ interval is meant, that the centrifugal pumps, having related to the low – speed class, are needed for the LCHS with the working substance active circulation.

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INTELLECTUAL EDUCATIONAL SYSTEM IN THE PROFESSIONAL TRAINING

Kistereva S.N., Gritsyuk V.A.

The existing system of education unable to provide the necessary level of professional training of information security specialists using basis types of educational and methodological provision, in the modern information society. This fact causes the need of elaboration and using of infocommunicational educational technologies, providing the formation of high competent information security specialists, using the institutes of intellectual educational systems at the educational process.

The analysis of Russian and foreign works allows to make conclusion that intellectual educational systems (IES) as new educational technologies are able to provide the new experience of education for future information security specialists in consideration of raised requirements for their training level all over the world. The specificity of IES consist in educational process modeling using dynamically developing knowledge base and automatic selection of efficient strategy and personal individual education trajectory, automated registration and analysis of new information entering in the database. In addition, intellectual educational systems allow to resolve the local problems of self-education of students and control the level of their professional skills. These systems can manage the student's education, resolving problems that they will meet in their further professional activity and controlling unassisted student's work.

Thus, the main task of present-day professor consist in the choosing of optimal and valid organization forms of education and using such a innovation techniques and methods in the educational process, that will provide efficient mastering of professionally significant knowledge, skills, acquirements necessary for future specialist at any professional activity. Using of intellectual educational system as the methodical guide of unassisted student's training doesn't just provide efficient mastering of professionally significant knowledge, skills, acquirements necessary for future specialist at any professional activity, but transform the professor's mission into the mission of organizer of student's educational activity, possessing the efficient tool that allow to achieve nice results in education's quality.

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APPLICATION OF COMPLEX METHODS TO SOFTWARE PRODUCT PROTECTION FOR ILLEGAL COPYING

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The problem of illegal usage of software products cropped up in 80 of XX century simultaneously with the appearance of personal computers, due to some specific features of this type of computers. It has happened as a result of hardware standardization and mass distribution of personal computers without any software.

Software-technical method is the most efficient method used nowadays. At the stage of development a program includes a fragment of code that checks conditions of the program usage and blocks it's execution in case of inconformity to the determinate terms of agreement.

Nowadays there are several types of software-technical protection, but each of them has its own disadvantages. For example one serial number could be used on some computers.

There're sufficient reasons for using a combination of several methods to achieve the most efficient software product protection. One of the most secure combinations is consolidation of cryptographic protection of executable code and external hardware acting as electronic key and external computation module that execute necessary computations for the software. Given method doesn't run the danger of such software attacks as disassembling, debugging and analysis of the memory dumps by reason of the protection of executable code by resistant cryptographic algorithms. Electronic key fulfills just computational functions therefore interception of passing information between the computer and the electronic key won't give desirable result for an intruder.

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MATHEMATICAL MODELING OF THE PROCESS OF WATER - SOLUBLE SALTS WITHDRAWAL FROM PIGMENT ORGANIC SUSPENSION BY DECANTATION

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The main qualitative attribute of pigments and coloring agents is dyeing concentration that depends on many factors, the main of which is presence of water-soluble salts in the finished products paste, generating at the process of synthesis. Water-soluble additive withdrawal is one of the effective way to increase the qualitative attribute of pigment.

Among the diversity of methods of water-soluble salts withdrawal from sediment the following can be pointed out: repulping, washing by filters, decantation.

Decantation is the easy and gentle cleaning method towards the pigment crystal structure, implying the process of hard and liquid phase's separation by means of sedimentation

Aiming to define the quantity of cleaning cycles necessary for archiving the desired concentration of water-soluble salts in pigment paste the mathematical model of the process of water -soluble salts withdrawal from organic pigment suspension was developed.

When developing the mathematical model the following assumptions are taken into consideration: the mass of water-soluble salts is less than mass of water and hard particles; during the sequence period (mixing together with sedimentation) the gradient of

water-soluble salts concentration in volume of suspension is considered as negligible; the character of dependence linking the equilibrium concentrations of water-soluble salts in paste and liquor is linear; the volume of paste in all cycles of washing is constant; pigment is a ball-type particle with radius r_0.

Suspensions and sediments of pigments and colorants show electrokinetic potential that influences the process of water-soluble salts withdrawal [1–3]. Fine particles of hard phase (pigment) of some micron size bear electrical charge in relation to surrounding aqueous dispersion medium that appears as a result of preferential absorption of ions of a definite sign, surface ionization or due to absorption at the surface of polar molecules [2,4]. The system of spatial-split charges appeared at the phase border line (pigment-liquor (polar liquor)) represents a double electric layer [3,4]. Complex – a pigment particle in the dispersion phase with the double electric layer surrounding it represents micelle. Aggregate inside micelle represents a hard phase (pigment particle), pigment with potentialdefining ions, composed by ions of chlorine Cl^-, represents a micelle core. Core together with the absorption layer form a particle, that surrounded by the diffuse layer. The micelle composition can be represented the following way:

$$\{[(\text{Pigment})_n m\text{Cl}^-]_x\text{Na}^+\}(m\text{-}x)\text{Na}^+$$

where n – number of potentialdefining molecules, m-number of potentialdefining ions of chlorine, x – number of sodium ions.

The amount of water-soluble salts on the surface of micelle core is sum of quantity of water-soluble salts counterions in the micelle absorption and diffuse layers:

$$\nu = \nu_{ad} + \nu_{dif} \quad (1)$$

where v – quantity of water-soluble salts on the surface of a micelle core, kmol; ν_{dif} – quantity of water-soluble salts in the micelle diffuse layer, kmol; ν_{ad} – quantity of water-soluble salts in the micelle absorption layer, kmol.

At diffuse layer the quantity of water-soluble salts counterions on the surface of a micelle particle in integral form:

$$\nu_{dif} = 4\pi \int_{r_1}^{r_3} C \cdot r^2 \cdot dr \quad (2)$$

where C – concentration of counterions in a diffuse area, kmol/m^3; r – the interval from the surface of a pigment particle, m; r_1 – the border of the absorption layer, m; r_3 – the border of the diffuse layer, m.

At the absorption layer the quantity of water-soluble salts counterions on the surface of a micelle core with allowance for maximum possible quantity of counterions:

$$\nu_{ad} = \frac{4\pi r_0^2}{S_{mol}} \cdot \frac{1}{1 + \frac{1}{C_l} \cdot e^{\Delta\mu + z \cdot F \cdot \frac{\varphi_0}{2}\left(1 + e^{-\frac{\delta}{\lambda}}\right)}} \quad (3)$$

where r_0 – radius of micelle core, m; S_{mol} – space occupied by one counterion, m^2; $\Delta\mu$ – the change of substance chemical potential at transfer from liquor to absorption layer, J/mol; φ-the difference of potential in the given point and in the liquid volume (at the «endless» moving from the surface) J/C; λ – the thickness of the diffuse layer; m; δ – the thickness of the absorption layer; m; F – Faraday constant, C; z – ions charge.

Let's bring into equation (1) equations (2-3):

$$\nu = 4\pi \cdot C_l \cdot \int_{r_0}^{r_0+\lambda} e^{-\frac{F \cdot z \cdot \varphi}{R \cdot T}} \cdot r^2 \cdot dr + \frac{4\pi r_0^2}{S_{mol}} \cdot \frac{1}{1 + \frac{1}{C_l} \cdot e^{\frac{\Delta\mu + z \cdot F \cdot \varphi_0 \cdot \left(1 + e^{\frac{\delta}{\lambda}}\right)}{2}}} \quad (4)$$

where R – gas constant J/(mol C) ; T – absolute temperature, C.

The material balance of quantity of water-soluble salts for sedimentation and decantation processes appeared as a result of summing the quantity of water-soluble salts in hard material (pigment) and in liquor will have the following form:

$$\nu_s = \nu_{pigment} + \nu_l = N_{p.p.} \cdot \nu_{p.p.} + C_l^0 \cdot V_p \cdot \left(1 - \upsilon_{pigment}\right) \quad (5)$$

ν_s – total quantity of the water-soluble salts in pigment suspension, kmol; ν_l – quantity of the water-soluble salts in liquor, kmol; $\nu_{pigment}$ – quantity of the water-soluble salts in the total pigment volume, kmol; $\nu_{p.p.}$ – quantity of the water-soluble salts on the surface of one pigment particle, kmol; V_p – volume of paste, m^3; $N_{p.p.}$ – number of pigment particles, p/m^3; $\upsilon_{pigment}$ – pigment volume fraction in paste.

The paste layer obtained after decantation is brought to the volume of the initial suspension by adding water as a solvent, as a result the volume of water placed to the paste will be $(V - V_p)$ m^3.

The quantity of water-soluble salts is not changed, the volume of paste is constant, the volume of water in liquor has grown up to $(V - V_p)$.

Therefore, the material balance of the process of paste dilution by a solvent (water) can be represented the following way:

$$V_p = (1 - \upsilon_{pigment}) \cdot V_l + (V - V_l) = V - \upsilon_{pigment} \cdot V_l \quad (6)$$

where V – volume of the initial suspension, m^3; V_l – volume of liquor, m^3.

The concentration of water-soluble salts in a solvent (water) becomes equal to C_l^1 while the quantity of substance of these salts doesn't change.

The concentration of water -soluble salts in a solvent (water) C_l^1 is found out using integral way (method of successive approximation).

1-st approximation is based on the approximate dilution of liquor only.

First integral step. Let's find the concentration of salt in liquor C_l^1 at the first dilution taking into consideration the concentration of salt in the initial liquor C_l^0 and volume of the initial suspension V m^3 and paste V_p m^3.

$$C_l^1 = C_l^0 \cdot \frac{V_p}{V} \quad (7)$$

where $C_l^i = C_p$ – mole concentration of water-soluble salts in a solvent, kmol/m^3.

Let's calculate the quantity of water-soluble salts on the surface of pigment

$$\nu_{pigment} = N_{p.p.} \cdot \nu_{p.p.} \quad (8)$$

where the quantity of one particle $\nu_{p.p.}$ is defined according to the equation (4)

Second integral step. Let's find the concentration of salts in liquor C_l^1 at the first dilution taking into consideration the quantity of water-soluble salts in a pigment suspension and on the pigment surface during the first dilution:

$$C_l^1 = \frac{\nu_s - \nu_{pigment}}{V_l} = \frac{\nu_s - N_{p.p.} \cdot \nu_{p.p.}}{V - \upsilon_{pigmenta} \cdot V_p} \quad (9)$$

The process of successive approximation for the equations (7)–(9) is held up to the moment when the difference between the iterations for C_l^1 calculating by equation (7) and C_l^1 – calculating by equation (9) will exceed the desired number.

The concentration of water-soluble salts in liquor and at the pigment surface doesn't change, the volume of liquor changes due to decantation influencing the total quantity of salts, as a result the material balance of the process of suspension sedimentation and dispersion phase (liquor) decantation can be represented the following way:

$$\nu_s = \nu_{pigment} + \nu_l = N_{p.p.} \cdot \nu_{p.p.} + C_l^1 \cdot V_p \cdot \left(1 - \upsilon_{pigment}\right) \quad (10)$$

These findings are used for the next process of dilution. The calculation is repeated until the moment the concentration will take the value less or equal to the desired.

The procedure offered allows to calculate the technological parameters of the process of water-soluble salts withdrawal from azopigment suspension by method of decantation and sedimentation.

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Materials of the Conference

AMINOACID COMPOSITION AND BIOLOGICAL VALUE OF SPRING WHEAT GRAINS IN SOUTH-EAST OF WESTERN SIBERIA

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Wheat takes leading position in human and farm animal's energetic and nutritious balance. However, FAO data about food supply has risen the question about necessity of cereals quality improvement which supposes protein increase in grain and its essential aminoacid enrichment [6].

Aminoacid composition is one of the most important protein characteristics. When analyzing quantity composition of aminoacid in wheat protein two maim aspect appear – aminoacid composition as biochemical criteria of biological value of fodder and food (according to essential aminoacid composition) and as structure basis of protein molecule, fulfilling specific functions in a cell [2]. The nutritious value of grain and its derived products can be improved if we learn to change the aminoacid composition of protein [3].

Influenced by external conditions not only content of total protein in grain is changed but its fraction composition as well. The difference in grain protein fractions according to aminoacid content leads to that the change of protein balance leads to the change of aminoacid quantity in grain total protein [5, 4].

Thus the aminoacid content, characterizing by stability of quality composition of protein, has enough wide variability according to quality depending on sort peculiarities and environment factors, providing the accumulation dynamic of separate forms and fractions of nitrogenous matters.

The research objective was to learn aminoacid composition of spring wheat grains, its variability influenced by sort peculiarities and environment conditions of growing and to estimate grain according to essential aminoacid composition.

Material and research method

The subject of research is examples of grain of eight sorts of spring hard and soft wheat of different groups of ripeness, growing in forest-steppe and steppe natural-climatic zones of South- East of Western Siberia, crops 2000- 2002. The analyzed grain is of sort of middle early ripeness group Iren, Obskaya 14, Novosibirskaya 15 and Novosibirskaya 29, mid-ripening- Aleshina and Omskaya 29, middle- late Omskaya 24, hard – Altaiskaya amber. The amonoacid composition analysis was carried out by IR-spectroscopy at infrapid.

Math processing of the obtained data was carried out by analysis of variance and correlation analysis [1] with the help of modern PC IBM-type with processor Pentium- type and higher, operating system Microsoft Windows 2000 and electronic tables Excel.

Research results

Independent on sort peculiarities and growing conditions wheat grain is characterized by relatively high content of glutamic acid, proline and leucine, low – histidine, tyrosine (table 1). Relatively low quantity of methionine, alanine, lysine, serine, threonine and valine is detected.

Table 1. Aminoacid composition of wheat grain, 2000- 2002

Aminoacids	Weight percentage %		
	variation	average	Variation coefficient, %
asparaginic	0,52 – 0,62	0,58	16,1
threonine	0,42 – 0,52	0,48	19,2
serine	0,47 – 0,48	0,47	2,1
glutamic	2,32 – 3,01	2,75	22,9
proline	1,02 – 1,20	1,13	15,0
glycine	0,50 – 0,53	0,52	5,7
alanine	0,43 – 0,44	0,44	2,3
valine	0,47 – 0,49	0,48	4,1
methionine	0,37 – 0,42	0,40	11,9
isoleucine	0,62 – 0,63	0,63	1,6
leucine	1,06 – 1,16	1,12	8,6
tyrosine	0,06 – 0,52	0,37	88,5
phenylalanine	0,69 – 0,71	0,70	2,8
histidine	0,22 – 0,33	0,30	33,3
lysine	0,44 – 0,46	0,45	2,2
arginine	0,59 – 0,65	0,63	9,2
total	10,82 – 11,81	11,42	8,4

Aminoacids tyrosine, histidine, glutamic, threonine, asparaginic, methionine are characterized as the most variable influenced by sort peculiarities and conditions of growing. More stable characteristic of aminoacid composition of grain is content of phenylalanine, isoleucine, alanine, valine, serine, lysine and glycine.

Total content of aminoacids dominated in steppe zone grain (10,90 – 11,68%) in comparison to forest-steppe (10,82 – 11,19%). Content correlation of separate aminoacids doesn't give clear advantage of this or that natural-climatic zone of grain cultivation. The difference in grain among zones is most significant according glutamic acid, in steppe- 24,6%, in forest-steppe - 23,6. There's slightly difference in asparaginic, serine, methionine, isoleucine, leucine, tyrosine, phenylalanine, arginine with small domination in grain growing in forest-steppe zone, and glutamic, histidine, lysine – in steppe zone.

Total content of aminoacids in different sorts ranges from 10,99 to 11,80% (V = 6,9%), and the average is 11,42%.

The most difference according to aminoacid content of grain of different ripeness groups is in quantity of tyrosine (V = 44,2%), histidine (V = 15,2%), glutamic acid (V = 14,0%), threonine (V = 10,0%) and asparaginic acid (V = 8,4%); the least isoleucine (V = 1,6%), valine (V = 2,0%), serine (V = 2,1%), alanine (V = 2,3%) and phenylalanine (V = 2,8%).

According to total content of aminoacids middle-late sorts dominate and trail early ripe. Thus, vegetation period prolongation helps in favorable conditions to accumulation and more aminoacids.

Content of aminoacids alanine, serine and isoleucine in grain is enough stable as according to sorts and according to natural- climatic zones.

Sort peculiarities are mostly appear in accumulation of such aminoacids as tyrosine, histidine, glutamic acid, threonine and methionine(relatively r = 0,99, 0,79, 0,73, 0,64 и 0,61).

There was detected medial dependence of total content of aminoacids from sort peculiarities, slight – from growing conditions and enough apparent from their mutual influence (relatively r = 0,51, 0,32 и 0,70).

It was detected strong but not high co-relation (r = 0,76) between total content of aminoacids and protein mass fraction. It can be explained by that not all aminoacids, synthesized in the process of active vegetation, go to corn seed protein biosynthesis. One of the reasons can be unfavorable conditions during earning period – yellowing and after-ripening.

Grain proteins even of the best wheat sorts are incomplete according to content of essential aminoacids. The most critical essential aminoacids are lysine and methionine, the balance of wheat grain protein is not more than 50 – 60% [7].

Total content of essential aminoacids in grain protein of the concerned sorts of spring wheat is average 4,58%. The difference according to natural-climatic zones is insignificant (0,2%). From total quantity of aminoacids essential make in steppe zone 39,8%, and in forest- steppe 40,4.

Table 2. Content of protein, limited essential aminoacids in grain and protein of spring soft wheat, 2000 – 2002

Sort	Protein mass fraction in grain, %	Mass fraction in essential aminoacids %					
		in grain			in protein		
		lysine	threonine	methionine	lysine	threonine	methionine
Novosibirskaya 15	17,3 / 15,9 *	0,45 / 0,44	0,47 / 0,42	0,38 / 0,42	2,60 / 2,77	2,72 / 2,64	2,20 / 2,64
Novosibirskaya 29	17,0 / 13,8	0,44 / 0,45	0,48 / 0,43	0,39 / 0,42	2,59 / 3,26	2,82 / 3,12	2,29 / 3,04
Iren	15,1 / 15,9	0,44 / 0,45	0,45 / 0,49	0,41 / 0,40	2,91 / 2,83	2,98 / 3,08	2,72 / 2,52
Omskaya 29	15,1 / 14,2	0,45 / 0,44	0,47 / 0,49	0,40 / 0,40	2,98 / 3,10	3,11 / 3,45	2,65 / 2,82
Average to sorts	16,1 / 15,0	0,45 / 0,45	0,47 / 0,46	0,40 / 0,41	2,77 / 2,99	2,92 / 3,07	2,48 / 2,73
Norm (according to WHO)	–	–	–	–	5,5	4,0	3,5

* – In numerator – stepe zone, in denominator – forest-steppe zone.

Content of lysine and threonine in proteins of the concerned sorts is lower than required by WHO- relatively 5,5 and 4,0 %. In the researched examples of grain the quantity of lysine ranged according to sorts and natural-climatic zones from 0,44 to 0,46% (V = 4,3%), in conversion to protein average is 2,88%, threonine- relatively from 0,42 to 0,58% (V = 27,6%) in grain and 3,0% in protein (table. 2).

Content of methionine in grain ranges from 0,37 to 0,41%, which corresponds to 2,2 – 2,82% of it in protein (V = 11,9%). According to WHO the content of sulfur containing aminoacids in complete protein shoulв be no less than 3,5%. Quantity of valine, leucine and phenylalanine correspond to complete protein.

Toa a greater degree total content of essential aminoacids ranges according to sorts (V в in steppe zone = 9,8 in forest-steppe - 5,1%) and less according to natural-climatic zones (range V = 1,2 – 4,9%). Range according to natural-climatic zones is methionine 9,0, lysine 7,4, threonine 4,9%.

The range between sorts according to quantity of essential aminoacids in protein within average is lysine 20,6, threonine 23,5, methionine 27,6%. Thus, quantity of methionine ranges the most. Natural-climatic zone range is methionine 9,0%, lysine 7,4, threonine - 4,9.

Conclusion

Mass fraction of aminoacid is in greater degree changes influenced by sort peculiarities and less- ecological conditions. Content of tyrosine, glutamic acid, proline and histidine is characterized by high variability; serine, alanine, glycine, valine, isoleucine, phenylalanine and lysine- low.

Content of essential aminoacid in grain protein from norms for complete protein (according to WHO)is for lysine- 48,8, , threonine 67,0, methionine - 69,1%.

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Materials of the Conference

EVALUATION OF THE RUSSIAN SOCIETY SPIRITUAL CULTURE IN THE MODERN CONDITIONS

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During the last decade of the XX century the value paradigm has moved toward the material component of the person's and society's life in whole. It has become the result of the considerable vast sociopolitical reforms in the country. Valuable for the Soviet citizen fundamental notions of the life principles were criticized. In the Russian society of the new formation under the pretence of long-awaited liberty permissiveness has appeared. This very notion has become the main in determination of the further development way. The result was the destruction of marriage and family institution, loss of moral and spiritual life core and self-identity. As we know "… flesh without spirit may exist but not as a conscious being. The spirit as the organizing power is incarnated in personality, society as a passive dormant power embodies blind bestial element" [1, p. 3].

Society without a spiritual component turns into a host of individuals for whom financial position is the main value. In view of this, the Russian society is making attempts to find its cultural and spiritual identity.

In particular, in 2004 in 25 regions of the Russian federation the Sociological centre RASS under the president of the RF under the direction of prof. V.E. Bojkov carried out the sociological research "The spiritual culture of the modern Russian society: state and forming tendencies". O.A. Mitroshenkov [2, p. 37-46] has analyzed the findings. Unfortunately conclusion is not comforting. In comparison with the positive tendencies of country cultural life (theatre, cinema and music) evaluation of changes in system of education is painful. Nearly 51% of population and 58% of experts have noted that the condition of the modern system of education is becoming worse. As the main reasons for this state in education O.A. Mitroshenkov names orientation toward future good financial position as the main value; aspiration for getting high-paid, prestigious job and as a result working professions are unclaimed among entrants; destruction of the fable about high education as the password in elite; deterioration of education; creation of shadow economy in education; situation when students' maintenance costs are lower than creation of a new workplace.

The overall score of the modern spiritual culture state looks like "domination of nonculture" (37% of asked people). O.A. Mitroshenkov points out that formation of such a negative definition of spiritual culture standard is influenced by the following factors: inefficiency of cultural politics; inaccessibility of many cultural benefits; confirmation of vulgar specimens as cultural norms; transformation of value system toward material benefits; pauperization of daily population way of life; averaging and popularization of television, mass media and so on.

Problems, which were revealed by this research in 2004, were intensified by international financial crisis, which started in 2009 and also demographical for Russia. The man with his personal characteristics is on the background now.

Summarizing the results of such a research we think it expedient to make our own research aimed at the determination of the level of spiritual culture formation of students in institutes of higher education. The basis for the research was the North Caucuses State Technical University and the Stavropol State University.

The aims of this work will help to discover:

- ✓ students' general idea about culture;
- ✓ attitude towards such notions as "spiritual culture", "spirituality", "spiritual life";
- ✓ criteria for differentiation of spiritual and material culture according to students' opinion;
- ✓ veritable reference points and value priorities of today's generation;
- ✓ the level of perception of ethic, legal, scientific, aesthetic, religious and philosophical doctrines in the past and modern time;
- ✓ circumstances which influence social status and person's prestige in the society;
- ✓ young generation's estimation of changes that have taken place in the spiritual life of the Russian culture and in the system of education during the last decade.

The results of this research will become the starting stage for pointing out problems, which are in urgent need of solving.

In particular there is a suggestion to add the special course "History and modern tendencies in spiritual culture of the Russian society" to curriculum of several departments. Its aim is to study spiritual heritage of Russia from the point of view of its history, formation of legal and legislative relations, ethic and aesthetic norms, relations between state and church, biography and destiny of Russian defenders and its outstanding figures and also the cultural peculiarities of each period. For North Caucasus institutions of higher education it is suggested to add the regional component, in which rich in traditions history of numerous nations that live here, peculiarity of their relation and integration in the Russian social space are reflected.

We cannot force person to be spiritually enriched. He responds neither punishment nor danger, no kindness. But only inner freedom and turn for analyzing his actions may open the way to virtue for a

person. Man must find necessity for truth by himself [1, p. 3].

Until this statement is not realized by society and every citizen of Russia individually critical situation in upbringing, education and cultural fields will be becoming worse.

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