CONTENTS

FACTOR MODEL OF TORCH INFECTION EFFECT ON THE NEWBORNS' VIABILITY

Agzamova Sh.A., Akhmedova D.I., Daminov T.O.
Tashkent Pediatric Medical Institute, Republic of Uzbekistan, Tashkent

Analysis of all-up examination of 419 deliveries in women with chronic latent TORCH infections with etiological verification of intrauterine infection of newborns has been conducted. A model of TORCH infections effect on the newborns viability allowed setting aside 10 most significant factors. Study on correlations of morpho-functional status of newborns allowed setting aside statistically significant relationships existing upon TORCH infections.
Keywords: intrauterine infection, newborns, TORCH-infection

Introduction

Today intrauterine infections by infectious matters of TORCH complex constitute the most urgent and debating point of modern pediatrics. Recently structure of infectious morbidity of a pregnant woman, a fetus and a newborn has changed. Role of pathogens of sexually transmitted diseases (STD), such as, chlamydial and micoplasmal, viral infections, such as, herpes simples virus and cytomegalovirus, anaerobic infection and fungi has acutely increased. Wide spread of TORCH-infection among women of reproductive age allows setting aside a problem of intrauterine infection and viability of newborns as one of the most urgent [1-9]. The study aimed at setting the most significant factors affecting viability of newborns in association with intrauterine TORCH infection aside.

Materials and methods

Analysis of all-up examination of 419 deliveries in women with chronic latent TORCH infections constitutes the basis of the study. Etiological verification of intrauterine infection of newborns was performed by 5 pathogens, such as, *Herpes simplex virus* (type 1/2 HSV), *Cytomegalovirus* (CMV), *Chlamidia trachomatis* (Ch), *Toxoplasma gondii* (T) and *Ureaplasma urealyticum* (U) by means of immunoenzymatic assay and PCR in the samples of umbilical cord and venous blood, urine and epipharyngeal scrapping. Gene diagnostics was conducted at the functional genomics laboratory, Institute of Genetics and Experimental Biology of Plants, Uzbekistan Academy of Sciences. Immunoenzymatic assay (IEA) for specific (anti-IgM and IgG) antibodies to TORCH pathogens was performed by means of test systems ("Vector-Best" Closed Joint-Stock Company, Novosibirsk, Russian Federation). To differentiate intrauterine infection IgG antibodies avidity index was used (IEA – anti-G-avidity, "Diagnostic systems" Scientific-Production Association, Nizhny Novgorod, Russian Federation). Testing and interpretation of findings was performed at the "Immunogentest" center, Institute of Immunology, Uzbekistan Academy of Sciences. General clinical examination of pregnant women and newborns was conducted in compliance with the standard methods. All results were registered in information cards specially developed for the study. To process the results MS Excel-XP and Statistica 6.0 [10] programs were used. Correlation analysis was performed by Kendall's method (Rk). To formulate a model and perform a factor analysis we used a method of principal components, "Varimax normalized" factor space rotation method.

Results and discussion

Screening IEA-diagnostics of 419 pregnant women helped detecting markers of TORCH pathogens, the highest percent of IEA positive results being found for CMV and 1/2 type HSV markers in 288 pregnant women (68.7%, CI 64.1-73.1) to comply with the data about high degree of population infection with these viruses [1-9]. Large majority (77.3%, CI 72.0-81.7) of the patients suffered mixed infection, such as, "CMV+1/2 type HSV" (52.3%, CI 47.5-57.1), "CMV+1/2 type HSV +Ch" (6/7, CI 4.3-9.1), "CMV+HSV+1/2 T" (6%, CI

3.6-8.4), "CMV+Ch" (4.5%, CI 2.5-6.5), "CMV+U" (1.9%), etc. CMV monoinfection was registered in 9.8% (CI 6.8-12.8) of cases, 1/2 type HSV in 6.7% (CI 4.3-8.4). In 100% latent, persistent (asymptomic) form of infection verified by the presence of IgG–antibodies to TORCH markers (4-fold and more titer increase). Considerable percent of monoviral infection [7.1% (CMV – 48.3%, CI 43.5-53.1, 1/2 type HSV – 23.3%, CI 19.1-27.5) should be noted, total sum of mixed infections in various combinations being 16.4% (CI 12.8-20.0). In total three perinatal losses (2.6%) were registered, in two cases caused by infection with toxoplasma and presence of multiple combined fatal malformations and in one case by presence of a positive HSV marker and congenital cardiac failure (mitral stenosis with left ventricular hypoplasia).

Given noticeable achievements in the prevention of intrauterine infections, a number of issues remain open. To name these, taking into account teratogenic effect of toxoplasma and 1/2 type HSV in primary infection during pregnancy it is impossible to ascertain risk of onset and progression of the complications above on the basis of some previous confidently described cases [8, 9]. In all examinees IEA showed absence of IgM-antibodies to CMV and type 1/2 HSV. Absence of IgM cannot serve as the grounds for clinical diagnosis elimination, since IgM presence can be masked by high concentration of IgG [5-9]. In other cases IgG level in infants was lower than the one in their mothers. Significant increase of IgG antibodies titer took place in 83 infants (7.16%). At birth neither clinical signs of intrauterine infection nor pathologic course of early adaptation could be registered in all newborn examinees to perform planned vaccination and to discharge them from the maternity house. On 20-35 days of life clinical picture of intrauterine infection was observed in 35 infants (30.2%), manifesting in central nervous system injury, hepatomegalia, icteric viral hepatitis syndrome and pneumonia and necessitating their hospitalization at the newborns' pathology department. It should be noted that IgGs of low avidity were registered in the infants. Detection of IgGs of low avidity in blood can be the evidence for primary infection, the fact clinically confirmed [11, 12].

Thus, assessment of clinical data of the infected infants showed presence of residual and subclinical infection forms in 30.2% 69.8%, respectively, residual one being associated with high degree of stigmatization and anomalies in development of osteocartilaginous tissue and urogenital system. Assessment of clinical and paraclinical data of the infected newborns showed intrauterine development retardation in 35.5% of them (respectively, 6%, 22.5% and 12.5% of hypotrophic, hypoplastic and dysplastic types). As to Apgar score, 27.6% of the infants scored 6-7, 24.1% of newborns having 5-6.

Factor analysis allowed setting aside 10 general factors determining structure of factor effect on the viability of the newborns in TORCH infection. The factors with the 73.1% of factorization completeness determined character of casual effect, insignificant and non-identified factors in the model brought together into so-called "zero" factor (F-0: 26.9%). Newborns' viability factor (F-1: 15.6%) determined somatotypical parameters, such as, body mass and length, head and chest circumference as well as integral assessment by Apgar score.

The second factor set aside (F-2: 9.7%) was found associated with conditions of realization of vertical mechanism for infection with CMV, HSV and toxoplasma. Of interest, the effect of chlamydial infection on newborns' viability was represented by separate factor (F3: 8.2%). Newborn sex factor in the model of viability (F4: 7.8%) influenced body mass and length being associated with a birthing mother's blood group. Ureaplasmatic infection was set aside as a separate factor too (F-5: 6.6%). Clinical ultrasound results of "uterus-placenta-fetus" system examination and fetometric parameters were part of the 6th factor (F-6: 6.5%) and were associated not only with the vascular abnormalities, but also with the type of delivery. The 7th factor

(F-7: 5.1%) influencing the newborns' viability was determined by birthing mothers' age and was associated with the amniorrhea term, newborns' body length and presence of toxoplasmosis markers in the umbilical blood. Complications in the recent and late pregnancy were set aside as a separate factor (F-9: 4.4%) associated with the women's blood groups as well as with the presence of mixed IEA-markers of CMV and toxoplasmosis. The 10th factor of newborns' viability upon TORCH infection in the birthing mothers (F-10: 4.3%) was determined by intrauterine infection with CMV and HSV being associated with early amniorrhea.

Relatively high risk of intrauterine fetal infection upon TORCH infections in pregnant women was confirmed by results of non-parametric correlation analysis. Upon comparison of the pregnant women's blood IEA results with those of PCR in the newborns direct dependence between presence of infection in the birthing mothers and their newborns was determined for HSV (Rk=+0.415, p<0.001), Ch (Rk=+0.579, p<0.001), T (Rk=+0.422, p<0.001) and U (Rk=+0.648, p<0.001). Of interest was determination of statistically confident tendency in the presence of negative correlation relationship between the newborn's body mass and presence of positive PCR result for HSV in venous blood (Rk=-0.316, p=0.009). Apgar score assessment showed negative correlation with PCR markers for HSV in the newborns (Rk=-0.432, p<0.001).Reverse character of the relationship is determined for IEA markers for toxoplasmosis and ureaplasmosis in the pregnant women (Rk=-0.433, p<0.001) indicating low probability of their combination in mixed infection. Presence of IEA marker for T in the pregnant women showed negative correlation with positive results for CMV in the newborns (Rk=-0.561, p<0.001) and HSV Rk=-0.419, p=0.008). Definite antagonism or manifestation of a protective effect in toxoplasmosis for viral infections is implied by that naturally requiring more detailed study and confirmation.

Thus, we have found positive correlation with type of delivery and chlamydiosis markers in the epipharyngeal scrapping and urine samples (Rk=+0.342, p<0.001, Rk=+0.511, p<0.001, respectively), between term and type of delivery a tendency for existence of negative relationship (Rk=-0.338, p<0.04) being observed. Similar character of correlation between recent pregnancy complications and parameters of newborns' head circumference (Rk=-0.361, p=0.004), presence of late pregnancy complications (Rk=-0.339, p=0.004) and IEA markers of Ch in the birthing mothers (Rk=-0.417, p<0.001). Thus, IEA markers of chlamydiosis negatively correlated with signs of cardio-vascular abnormalities in "uterus-placenta-fetus" system as per clinical ultrasound findings (Rk=-0.516, p<0.0010). Of interest is the fact that recent pregnancy complications were found to positively correlate with IEA markers of toxoplasmosis (Rk=+0.419, p<0.001). Late pregnancy complications had a negative correlation with the newborn's sex (Rk=-0.302, p=0.015) and Apgar score assessment (Rk=-0.38, p=0.009). IEA markers of CMV in the pregnant patients positively correlated with HSV findings (Rk=+0.270, p=0.001), implying high frequency of mixed forms. CMV infection in the pregnant patients has a statistically confident association with the fetus's viability (Rk=+0.341, p=0.004) as well as with the newborns' head circumference (Rk=-0.302, p=0.015) and positive PCR findings of CMV in the umbilical blood (Rk=+0.487, p=0.001) confirming the fact of intrauterine infection. Statically confident positive correlation between blood circulation disorders in the fetoplacenta complex found by means of clinical ultrasound and positive response to CMV in a newborn (Rk=+0.415, p=0.009). Viability of both a fetus and a newborn positively correlated with the newborns' head circumference (Rk=+0.316, p=0.009) and Apgar score assessment (Rk=+0.462, p<0.001), viability index negatively correlating with the manifestation extent of cardiac abnormalities in fetoplacenta complex (Rk=-0.380, p=0.001).

Conclusion

Model for TORCH infection effect on the newborns' viability allowed setting aside 10 most significant factors, associating with peculiarities of birthing mothers, course of pregnancy, intrauterine infection risk, pathogen's type and somatotypic parameters of the newborns. Determination of statistically significant regularities and phenomena of interrelation between TORCH infection markers in birthing mothers and newborns allow speaking of high intrauterine infection risk upon HSV and chlamydiosis. Study on correlations of newborns' morpho-functional status makes possible setting aside statistically significant interrelations existing in TORCH infection. As the result, new approaches to development of methods for prevention and prognosis of pregnancy and delivery outcomes are possible.

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ACTIVITY STATE OF NITROGEN OXIDE SYSTEM IN BLOOD OF NEONATES WITH INCREASED PERINATAL RISK

Gafarova F.M.
Tashkent Medical Academy

Evaluation of activity state of nitrogen oxide system in blood of neonates with increased perinatal risk was studied. An increase in NO production should be considered as compensatory-adaptive reaction aimed at preservation of microcirculation hemodynamics processes in organs and systems of neonates.
Degree of interrelation and interconditionality of disorders between NO level, activity of enzymes NOS, HP, O_2^-, $ONOO^-$ and SOD formed a single pathogenetic mechanism of severity and progression of damage of vital important organs and systems and related features of clinical symptomatic in mature and immature neonates with PR.
Key words: mature and immature neonates, perinatal factors, endothelial system, nitrogen oxide.

One of the key places in discussion of therapy problems in modern neonatology takes search for an non-selective effect of therapeutic remedies on different regulation links of synthesis isoforms of nitrogen oxide (NOS) [14, 23]. It is caused by that hyperproduction of nitrogen oxide (NO) in the brain in response to hypoxia effect has selective character – it is increasing in structures of neuronal tissue preferable due to expression of neuronal NO-synthase (nNOS) and inducible one (iNOS) and decrease in content of endothelial NOS (eNOS) [9]. Immunohistochemistry investigations exhibited that an intensive expression of iNOS occurs not only in neurons themselves but also in astrocytes and microglial cells [24, 25]. An increase of production of induced iNOS-NO in cerebral cells provokes their damage and death [10]. At the same time, a decrease of production of endothelial NO also leads to vasoconstriction and, therefore, makes difficult passage of oxygen to the brain. Data available indicate that an effect of neurotropic therapeutic remedies in conditions of reduced activity of eNOS may result in no protection from hypoxia, in contrast, in reinforcement of damaged effect on the brain [2]. An effective neuroprotective effect is reached by selective inhibition of nNOS that has neurotoxic effect and stimulation of eNOS [3, 4]. It is considered that the main stimulus of iNOS expression is activation of free radicals' processes that is related in hypoxia with activation of cytokins' synthesis [8], as well as with inhibition of activity of antioxidants' enzymes of superoxide dismutase (SOD) and glutathione peroxidase [5]. Free radicals, cytokins, tumor necrosis factor (TNFα), interferon gamma (iFN-γ), in their turn, activate transcription factor NF-kB that presents a key link of gene expression iNOS [6, 7]. The data available of possibility of an increase in content of NO in hypoxia irrespective of NO-synthase due to formation of NO from nitrates and nitrites during nitri-nitrat-reductases' reactions [11] or during non-fermentative chemical transformations from ammonia [10, 11]. Hyperexcretion of NO may have a damaged effect on cells due to direct and intermittent mechanisms. But the most important mechanism of an intermittent damaged effect of excess of NO considers to be an interplay between NO and superoxide anion (O_2^-), formation of peroxinitrite ($ONOO^-$) [7, 12].

Peroxinitrite easy permeates lipid bilayer of membrane, inhibites proteins of mitochondrial respiratory chain that leads to reduction in production of ATP (adenosine triphosphate) and damage of calcium homeostasis: they inhibite antioxidant enzymes and, therefore, reinforce formation of O_2^- [13]. Peroxinitrite is modified and breaks DNA, simultaneously inhibites DNA-synthase, and, therefore, contributes to process of an accelerated apoptosis and cellular necrosis [6, 8]. It is supposed that hyperproduction of NO, $ONOO^-$ has main contribution to development of damage of cerebral tissue, disturbance of cerebral hemodynamics, an

increase of vascular permeability and edema of cerebral tissues [3, 4].

Deficit of information noted to be to present day in home literature about state of metabolism of endogen NO, formation of $ONOO^-$, an activity level of systems responsible for O_2^- generation and its detoxification in organism of newborns in an early postnatal period. It remains unclear mechanisms in which result a role of molecule of NO changes from protective to damaged, data absence about interrelation of a level of production of NO, nitrit-nitrate-reductase and NADPH-oxidase reactions, activities of superoxide dismutase and their role in development and progression of perinatal risk in neonates (PR).

In this connection our work is aimed at evaluation of activity state of system of nitrogen oxide in blood of newborns with increased perinatal risk.

Material and methods

Cord and venous blood of 123 neonates with perinatal risk (PR) on the day 3 has been studied. The groups of neonates were divided in accordance with recommendations of Ju.I. Baryshev [1]. Forty eight newborns with low PR (1st gr.) including 25 mature and 23 immature into investigation were included. Into investigation were also included 40 newborns with increased PR (2nd gr.) including 20 mature and 20 immature as well as 35 neonates with high PR (3rd gr.) of them 18 mature and 17 immature.

The findings of cord and venous blood on day 3 received from 20 neonates with normal development and born from mothers with physiologic pregnancies and labors served as controls. Endogen level of NO by its general stable metabolites (NO_2^- и NO_3^-) by using of Griss reagent [20], activity of eNOS – by changes in NO production from L-arginine (10 mkg/ml) in presence of NADPH [15], activity of NADPH-dependent nitrate reductase (NR) [22], level of $ONOO^-$ – by velocity of hydroxidation [21] in whole blood were determined. Velocity of generation of O_2^- was determined by quantity of inhibited SOD in restoration of cytochrome C [18], and activity of SOD was estimated by inhibition grade of restoration of nitro-blue tetrazol in presence of phenosine metasulfate [19].

Statistical treatment of the findings was made by means of the licenced program package Statistica (version 5.1. Stat Soft). Reliability of differences between comparing indices was determined by criterion of Student in case of a normal distribution and homogeneous dispersiveness and criterion of Mann-Witney, its analogue, for non-parametric distributions. Correlation was established by Pearson. Differences were considered reliable in $P<0.05$.

Results and discussion

Studies carried out exhibited substantial differences in the studying indices in cord and venous blood of neonates in control group. Activities of eNOS and NO in venous blood were higher, and activity of NR, content of $ONOO^-$ and velocity of generation O_2^- – were reliably lower than indices in cord blood of newborns (Table). Difference in NO-system is likely to determine the further compensatory-adaptive reactions to environmental changes and nutrition, because cord blood of neonates reflects state of feto-placental complex and intrauterine development of fetus. Venous blood reflects functional-metabolic state of newborn. Metabolic activity and blood supply of vital important organs and systems in an early postnatal period of neonates in the future depends upon an initial level of NO-system.

Similar updates in a level of concentration of NO, activity of NOS, NR, concentration of $ONOO^-$, velocity of growth of O_2^- compared with the data of control group were noted in mature and immature neonates with perinatal risk. These changes were aggravating especially in immature neonates with the growing grade of perinatal risk. Content of main stable NO products in cord and venous blood of mature neonates with the 1st grade of perinatal risk (PR) were preserved in limits of estimates of control group, in newborns with the 2nd grade reliably exceeded them by 37.3 and 27.8% ($P<0.001$ and $P<0.01$); with the 3rd grade – by 79.5 and 40.2% ($P<0.001$

и P<0.01). At the same time this index in immature neonates with the 1st grade of PR exceeded by 28.9 and 27.8% (P<0.001 and P<0.01); with the 2nd grade – by 67.5 and 62.9% (P<0.001 and P<0.01); with the 3rd grade – by 150.6 and 90.7% (P<0.001 and P<0.01) respectively.

Activity of NOS in cord blood of mature newborns with the 1st, 2nd and 3rd grade of PR was reduced by 9.6 (P>0.05), 19.2 and 29.6% (P<0.05 and P<0.01), in immature ones – by 21.6 (P<0.01), 34.4 and 49.6% (P<0.001 and P<0.01). Such a situation of updates in NOS activity noted to be in venous blood on the day 3 of life of newborns.

Activity of neonatal risk (NR) in cord blood was increasing proportional to a grade of perinatal risk (PR) both in mature (by 2.0% (P<0.1), 52.1 and 79.2% (P<0.001 and P<0.01)), and in immature neonates (by 45.8; 91.7 and 191.7% (P<0.001 , P<0.001 and P<0.001)), and in venous blood – by 4.5 (P≥0.1), 13.6 (P≥0.05) and 100% (P<0.001) – in immature – by 40.9, 72.3 and 200% (P<0.001, P<0.001 and P<0.001) – in immature newborns to a grade of PR respectively.

In connection with the revealed increase of activity of PR it may be supposed that a high level of NO in cord and venous blood of mature and immature neonates was caused by this enzyme. That was evidenced by a growth of correlation between NO index and NR activity depending on PR grade. Thus, correlation statistically markedly increasing in its determination by indices of cord blood of mature newborns with the 1st, 2nd and 3rd PR grade accounted for r=+0.56 (P<0.05), +0.68 and 0.77 (P<0.01), in immature – r=+0.69 (P<0.01), +0.79 and 0.84 (P<0.01) in investigation of venous blood. Respectively r=+0.48 (P<0.05), 0.70 and 0.86 (P<0.001) and 0.54 (P<0.05), 0.66 and 0.81 (P<0.001).

Against a background of an increase in NO content in cord and venous blood of neonates was fixed a high velocity of formation of O_2^-, which dynamic of an increase of intensity corresponded to a grade of perinatal risk and term of delivery of neonates (Table). Changes in activity of enzyme SOD [10] may be considered among causes of an increase of formation O_2^-. In presence of enzyme SOD a level of O_2^- was underwent transformations in molecular O_2 in a way $^{\cdot}O_2 + {}^{\cdot}O_2 + 2H+ \rightarrow H_2O_2 + O_2$ [26]. Studying SOD activity in cord blood of mature neonates with the 1st and 2nd grade of PR showed its reliable increase by 51.7 (P<0.001) and 20.0% (P<0.05) as compared with control babies, and 3rd grade PR by only 6.0% (P<0.05), in immature neonates with the 1st grade – by 22.0% (P<0.05), the 2nd one – by 12.0% (P<0.05), and with the 3rd one, in contrast, reduced by 17.7% (P<0.05). Similar situation in updates in SOD activity of mature and immature neonates with PR was observed in venous blood. It exceeded control data in mature neonates with PR of the 1st grade by 26.9% (P<0.01), with the 2nd one – by 10.7% (P≥0.05), and with the 3rd one was reduced by 19.3% (P<0.05); SOD activity in immature neonates with the 1st grade of PR exceeded by 16.9% (P<0.05), and with the 2nd and 3rd grades was lower by 6.4% (P<0.05) and 31.0% (P<0.05) compared with controls.

In this connection it may be supposed that high content of O_2^- in cord and venous blood of mature and immature neonates was caused by an insufficient potential capacity of enzymatic activity of SOD to compensate excess of O_2 in blood. In these cases a high content of O_2^-, how show the literature data [6,7,8], in presence of hyperexpression NO has biochemical reactions with formation of $ONOO^-$. It was confirmed by our studies. An increased quantity of O_2^- and NO in cord and venous blood in mature and immature neonates with PR is coincided with an increased concentration of $ONOO^-$ in them. So, a level of $ONOO^-$ in cord blood of mature newborns with the 1st, 2nd and 3rd grade of PR exceeded control data by 25.0% (P<0.01), 50 and 91.7% (P<0.001), in immature – by 41.7; 91.7 and 208.3% (P<0.001); in venous blood – by 11.2%(P≥0.05), 125.0; 321.5% (P<0.001 and P<0.001) and by 100.0; 312.5 and 512.5% (P<0.001) respectively.

Thus, results of studies obtained showed that in cord and venous blood of both mature and immature newborns depending on PR grade were increasing disorders in NO-system. An increase in NO level how follows from data obtained occurs due to activation of NR reaction that contributes to preservation of state of cellular membranes on stable level [11]. At the same time, an increase in NR activity and a level in cord and venous blood in mature and immature neonates with PR NO we consider as its adaptive reaction to decrease in functional activity of enzyme eNOS. In conditions of prolonged hypoxic state occurs NO production from precursor of L-arginine, because this reaction with participation of eNOS may occur in presence of sufficient quantity of oxygen [5, 9] and a more ancient mechanism was activated – cycle of nitrogen oxide with involvement of nitrite nitrate reductases' enzymes that transform NO_2^- and NO_3^- into NO 100-1000 times more than its formation with articip of enzyme NOS [11]. In conditions of hypoxia a process of O_2^- [6,8] formation was stimulated which restraining factor is SOD activation [9, 10]. The increase in SOD activity in mature and immature neonates with the 1st and 2nd PR grade is likely to be adequate to this process aimed at defense and maintenance of membranes' stability, metabolic systems in organism tissues from oxidative destruction of O_2^- or singlet oxygen ($^{\cdot}O_2^-$) [26]. At the same time, a high level of O_2^- may be one of the important factors of inhibition and modification of membrane-dependent enzymatic systems including SOD [12, 13] as consequence of spontaneous activation of free-radicals' reactions and processes of lipid peroxidation [10]. In this connection it may be considered that reduction in SOD activity in mature with the 3rd grade and immature neonates with the 2nd and 3rd grade of PR in cord and venous blood is related with hyperexpression of O_2^- as well as formation of high reactive cytotoxic compound $ONOO^-$. Taking into consideration an importance of disorders revealed by us a scheme of possible mechanisms of formation in PR neonates with involvement of NO-system.

It is given from the figure presented that inhibition of eNOS in cord and venous blood and development of endothelial dysfunction (ED) are important factors in formation of clinical manifestations in neonates with PR. This, in its turn, leads to generalized disorders in microcirculation and hemodynamics processes in a system mother-fetus, and, as consequence, to hypoxia of newborn [16, 27].

As response to hypoxia a cycle NO with involvement of NR enzyme and NADPH-oxidase was activated [17]. Content of NO and O_2^- in cord and venous blood were increasing that served important factors of stimulating reaction of their interplay with formatting stable, cytotoxic compound $ONOO^-$ prolonged preserving in tissues. Together with $ONOO^-$ and O_2^- these compounds have toxic effect on organs' and systems' tissues. Toxic effect of O_2^- and, it may be supposed, $ONOO^-$, is determined by tension of enzyme of antioxidant system SOD.

If hyperexpression of O_2^- in cord and venous blood would be compensated by a high activity of SOD in mature and immature neonates will be developed the 1st or the 2nd grade of PR, and in non-compensated (inhibited) activity of SOD enzyme in mature is developed the 3rd grade of PR and in immature – the 2nd and the 3rd grade of PR.

CONCLUSION

Thus, studies carried out showed that an increase in NO production should be considered as compensatory-adaptive reaction aimed at preservation of microcirculation hemodynamics processes in organs and systems of neonates that was demonstrated in cord and venous blood of neonates born from mothers with normal physiologic pregnancy and delivery. NO level in control was increasing due to increasing of eNOS activity. But in conditions of hypoxia, development of intra- and perinatal pathology the cytoprotective effect by growing NO concentration in cord and venous blood was giving place to cytotoxic effect. In this mechanism an impor-

tant role plays hyperexpression of HP, O_2^-, as well as $ONOO^-$. SOD activity incompensated to this process contributed to increasing level of O_2^-. Degree of interconnection and interconditionality between NO level and activity of enzymes eNOS, HP, O_2^-, $ONOO^-$ and SOD formed a single pathogenetic mechanism of severity and progression of damage of vital important organs and systems and related features of clinical symptomatic in mature and immature neonates with PR.

Conclusions

1. It was revealed a unilateral increase in NO level, inhibition of enzymeMOS, stimulation of HP activity, hyperexpression of O_2^- and $ONOO^-$ in cord blood of mature and immature neonates with PR with the 1st and 2nd grade and in venous blood of neonates with the 1st grade of PR and depression of its activity in venous blood in mature newborns with the 4rd grade of PR and in immature ones with the 3rd grade of PR in cord blood.

2. Progression of PR grade in mature and immature neonates was associated with growth dynamic in a level NR activity in cord and venous blood, velocity of O_2^- formation, concentration of peroxinitrite ($ONOO^-$) and NO.

3. Disorders in NO-system activities in cord and venous blood are important pathogenetic factors of formation and progression of pathologic process in mature and immature neonates with PR.

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THEORY OF THE MECHANICAL ACTIVITY OF THE LUNGS IS A NEW HORIZON OF THE DEVELOPMENT OF CLINICAL RESPIRATORY PHYSIOLOGY

Tetenev F.F.[1], Tetenev K.F.[2]

[1] *The Department of Propedeutics into Internal Diseases, Siberian State Medical University, Tomsk, Russia*

[2] *Vermont Pulmonary Center, Medical College of Vermont University, Burlington, the USA*

The paper deals with the main paradoxical facts, which are revealed in the investigation of respiratory mechanics in, practically, normal humans and patients with diseases of internal organs as well as in the experiment on animals. The investigation results are evaluated from the viewpoint of the requirements of the 1st thermodynamics law, which supports the fact that the lungs possess the property of independent mechanical activity.

Keywords: transpulmonary pressure, transpulmonary pressure plateau, general pulmonary hysteresis, elastic hysteresis, negative general pulmonary hysteresis, negative elastic pulmonary hysteresis.

Despite the considerable success of the methods of the functional diagnostics of the ventilation apparatus introduced into clinical practice, in clinical respiratory physiology there has clearly appeared a need to examine the most important theoretical points of respiratory mechanics in a new way. The conventional Donders theory considers the lungs to be a passive elastic organ whose respiratory movement is caused only by the activity of the respiratory muscles. The theory was developed in 1853, and since then it has been affecting the style of thinking in clinical respiratory physiology [1]. The above theory was sufficient for the solution of pragmatic tasks, so in the middle of the 20th century a complex of devices was developed intended for clinical diagnostics of disorders in the different pulmonary functions of the lungs. However, the results of the investigation into respiratory mechanics did not agree completely with the Donders theory. In the 70ies the researchers tried to explain the complicated manifestation of the mechanical properties of the lungs within the scope of the Donders theory [2]. Those attempts, however, were unsuccessful, which could be considered a sign of the crisis of the old paradigm and a reason for putting forward a theory of the mechanical activity of the lungs [3]. The new theory equipped with new methods of investigation has proposed some promising trends of the development of respiratory physiology, and so it has a real claim to play the role of a new paradigm [1, 4]. Since most researchers continue to study micromechanics and tissue mechanics within the scope of the old paradigm [5]. The purpose of this paper is to explain the most important complex problems using the new theory.

In the 50ies a safe method was developed to measure transpulmonary pressure (TPP) taking into account the difference in pressure in the esophagus and the mouth. Simultaneous recording of the TPP and the airflow allowed investigating respiratory mechanics [3]. Since then clinical respiratory physiology began to accumulate data on the elastance of the lungs of healthy humans, patients with various forms of pathology and animals in experiment. At the same time, the researchers started to find some phenomena that could not be interpreted in terms of the generally accepted knowledge. However, the old paradigm was so stable that they either considered the unusual phenomena artifacts or, as a rule, failed to notice them at all.

The most complicated issue was how to assess the state of the lung elastance. Under spontaneous breathing the lung compliance is determined by the relation of the respiratory volume to the TPP difference at the beginning and the end of inspiration. The

above index, however, proved unstable: even in healthy individuals the lung compliance alters with changing speed of the airflow. With obstructive pulmonary emphysema it is lower, which implies a higher elastance. A decrease in the lung elastance in the case of emphysema is evident. The above paradox was accounted for by the fact that at the end of inspiration the alveolar pressure fails to level, so the dynamic component is added to the static elastic pressure. Due to that the lung compliance measured in such a way was referred to as dynamic. In order to eliminate the above component, it was suggested that the static elastic compliance be measured using the technique of interruption of the airflow for 0.5 s [6], although it was found to be both higher and lower than the dynamic one. Then the researchers stopped paying attention to such paradoxes and began to measure the lung elastance in quasistatic conditions at a slow deep inspiration in the linear part of the pressure-volume diagram [7]. The above method suited the obstructive theory of disorder in respiratory mechanics, whereas the question on assessing the lung elastance in spontaneous breathing remained unsolved.

According to the theory of the mechanical activity of the lungs, there is a source of mechanical energy in the lung structure. Its operation is related in a complex way to the work of the respiratory muscles both in healthy humans and patients. It can either decrease the work of the respiratory muscles to various extent or, on the contrary, increase it, which explains the absence of strict specificity in the indices of the respiratory mechanics in the diagnostics of higher or lower values of intrapulmonary resistance under pathology. Besides, this function explains the mechanism of appearance of some paradoxical phenomena.

Levelling of the pressure at the end of inspiration in healthy humans and patients occurs instantaneously. Therefore, changes in the dynamic compliance of the lungs with increasing airflow are caused by the changes in the lung elastance. With the obstructive disorders of the ventilation function during spontaneous breathing there occurs an active increase in the elastance to counteract the valve obstruction of the bronchus and ensure spontaneous respiratory mechanics [8]. Comparison of the values of the dynamic compliance of the lungs and their general compliance (the relation of the total lung capacity (TLC) to their maximal elastic recoil) allowed calculating the functional coefficient of the lung elastance [9]. The use of the technique of interruption of the airflow for 0.2 s allowed revealing the possibility to separately measure the operation of the intrapulmonary and extrapulmonary sources of the mechanical energy of spontaneous breathing [10, 11].

Webb et al. [12] were the first to describe predominance of the amplitude of the respiratory variations of the pressure in the wedged bronchus over that of the intrapleural pressure and show the photocopies of the pressure curves [12]. However, they attributed the above phenomenon to the effect of the perialveolar pressure, which contradicted the 1st fundamental thermodynamics law. A similar methodological mistake was made by the researchers that proposed a speculative theory on alveole interdependence, which explains the predominance of the negative pressure in the alveoles as compared to the intrapleural pressure [13, 14, 15]. Later Macklem P., who seemed to understand the unsteady theoretical position, put forward an idea of a promising possibility of search for the contracting elements in the lung structures [2].

Taking into account the universal character of the 1st thermodynamics law there is no need to look for additional proof to see that the predominance of the pressure amplitude in the brunchus over that inside the pleura is the manifestation of the regional mechanical activity of the lungs in the case the brunchus is wedged. The above phenomenon was supported by the experimental studies. It was found that it was definitely missing in the isolated lungs [16, 17], which means that the lungs show independent mechanical activity only in the living organism under conditions of integrity of the ventilation apparatus.

Pressure in the bronchus was recorded to study the elastic hysteresis in the lungs and

the nature of the distortion of the TPP plateau. The elastic hysteresis was found in patients with obstructive pulmonary emphysema [3]. A respiratory loop was built for the respiratory cycle of a depth close to the total lung capacity. The airflow was interrupted several times for 0.5 s during inspiration and expiration to measure static elastic pressure at various levels of the respiratory volume. The TPP was divided into dynamic (alveolar pressure) and static (elastic pressure) components. The respiratory loop area was numerically equal to the work of overcoming the total inelastic resistance of the lungs (TIR), which includes the aerodynamic (bronchial) resistance (AR), tissue friction (TF) and inertial resistance (IR). The TF and IR values are usually neglected not only because they are small but also because they are hard to measure. The values of the elastic pressure inside the respiratory loop were measured using the method of interruption of the airflow for 0.5 s, and the curves of the static elastic pressure during inspiration and expiration were also obtained. In patients with pulmonary emphysema the static elastic pressure curve during inspiration was located in the zone of more negative pressure as compared to that corresponding to expiration. Thus, inside the respiratory loop another hysteresis loop was obtained. The mismatch of the curves of the static elastic pressure during inspiration and expiration was called elastic hysteresis. It was quite logical to explain this phenomenon by the work of breathing needed to overcome the TF. However, in healthy humans we found a paradox, which lay in the fact that the static elastic pressure curve during inspiration was partly or completely located in the zone of less negative pressure compared to that of expiration. This phenomenon was called the negative elastic hysteresis [1, 3, 4] and it was explained by the manifestation of the mechanical activity of the lungs based on the requirements of the 1st thermodynamics law. That was how the theory on the mechanical activity of the lungs came into being. It was supported by the experimental studies, which unambiguously showed the absence of the negative elastic hysteresis in the isolated lungs.

Explanation of the mechanism of the formation of the negative elastic hysteresis deserves special attention. The method of interrupting the airflow was suggested to ensure a more accurate division of the TPP into the static and dynamic components, which was an axiom in the Donders theory on respiratory mechanics. The distortion of TPP plateau during inspiration was mistakenly accounted for by levelling of the alveolar pressure exponentially. The plateau distortion toward the negative pressure during expiration was attributed to the collapse of the epiglottis, and a greater increase in the mouth pressure as compared to the imtrathoracic pressure was explained by the contraction of the mouth muscles [6]. However, the above explanations were not supported in further research [3].

The distortion of the TPP plateau during inspiration was studied clinically and experimentally on animals as well as in the isolated human and animal lungs [3, 17, 18]. At the interruption of the airflow during inspiration there appears a plateau in the spirogram. The TPP curve also shows a plateau whose position and shape, however, are not exactly what should be expected from the Donders theory. The intrathoracic pressure and the pressure in the mouth are joined on both sides of the membrane of the differential pressure sensor. When the airflow is interrupted the alveolar pressure instantaneously levels along with the pressure in the mouth. Since the negative value of the alveolar pressure is higher than that of the intrathoracic pressure, the sensor membrane is shifted towards the positive pressure. During expiration the alveolar pressure increases to a greater extent than the intrathoracic pressure. As a result, the TPP plateau is shifted towards the negative pressure. Besides, at the interruption of the airflow the sucking effect of the lungs during inspiration and contraction during expiration increase, with the plateau in the plot being distorted. During inspiration it looks like a spike directed toward the positive zone. Displacement and distortion of the TPP plateau reflect graphically the lung inspiratory and expiratory action. In the isolated human and

animal lungs the above manifestations of the lung mechanical activity are not observed.

In studying the integral respiratory mechanics, in rare instances inversion of the general pulmonary hysteresis was observed in patients with obstructive pathology rather than with pneumonia and myopathy [4]. During investigation of the regional respiratory mechanics a general negative hysteresis was revealed much more often suggesting the regional mechanical activity of the lungs, which was clearly pronounced in the lung upper zones [19, 20].

Thus, the theory of the mechanical activity of the lungs allowed clarifying the numerous paradoxes, which earlier seemed unaccountable and, namely, 1) a decrease in the dynamic compliance of the lungs at emphysema when their elastic ability is low; 2) distortion of the transpulmonary pressure plateau at the interruption of the airflow; 3) negative elastic and general hysteresis of the lungs; 4) predominance of the amplitude of the respiratory variation of the alveolar pressure over that of the intrathoracic pressure; 5) the reason for nonspecificity of the conventional indices of the respiratory mechanics for diagnostics of the functional disorders of the ventilation apparatus in pathological states. It has allowed increasing knowledge of clinical respiratory physiology as well as determining promising trends of its further development, e.g. studying the morphology and the functions of the source of the lung mechanical energy, the development of the method of investigating the respiratory mechanics suitable for clinical practice.

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Materials of Conferences

HYGIENIC PECULARITIES OF FORMING OF CRITICAL INTESTINAL INFECTIONS IN SOTHERN KAZAKHSTAN

Kuadykova A.K.
MKTU under Yasavi Turkestan, Kazakhstan

One of the serious medically-social problems of public health is high morbidity of critical intestinal infections (CII), which is registered in the majority of countries in the world. The aim of our research is the carrying out of analysis of dynamic of morbidity among the population of southern Kazakhstan of many years and single out the peculiarities of forming and conformities of revealing of epidemic process while critical intestinal infections.

During the period from 1985 to 2008 years the morbidity of CII at the territory of southern Kazakhstan is 380,74 to the 100 thousands of population. The dynamic of morbidity of CII was characterized by the growth from the middle of eighties, the pick of morbidity in 1989-1991 years with the second tendency to lowering. The most high showing was registered in 1990 (613,3 to the 100 000 of population) and reliably exceeded in 1,5 times the indicator by the republic.

There was stated the correlative dependence between some factors of environment and forming of high level of morbidity:

between the morbidity of population of CII and the quantity of inadequate tests of water by the bacteriological showings (r = 0,62, n = 19);

monthly morbidity of CII correlated with the quality of milk production by the bacteriological showings (r = 0,62, n = 19);

between the morbidity of children and teenagers of southern region of republic with sanitary-hygienic and technical level of infant and teenage objects (r = 0,51, n = 19);

between the morbidity of CII of all population with the condition of morbidity of organs of digestion (r = 0,72, n = 19);

between the morbidity of CII among the total population and with unsatisfactory technical condition of nutritional objects (r = 0,69, n = 19).

Received results of research will be used by us while the development and realization of preventive activities, including hygienic, medically-organizational, informatively-explanatory work and hygienic education of population. The introduction of the complex of preventive activities will allow to optimize the quality of environment and to promote the decrease of the morbidity of critical intestinal infections in the southern region of Kazakhstan.

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THE CHILDREN LIFE QUALITY ANALYSIS WITH THEIR PHYSICALLY CHALLENGED POSSIBILITIES

Kuandykov E.K., Abdrakhmanov Zh.S., Ospanova Zh.A.
The MKTU after A. Yasavy, the STU RCDI the Turkestan city, Kazakhstan

The Abstract. The children medical and social rehabilitation (MSR) global challenge with their physically challenged possibilities is the child normal life quality (LQ) preservation. So, it is much necessary the LQ index examination and the following study for the children rehabilitation arrangements more efficient conducing with their physically challenged possibilities. Thus, the life quality (LQ), by the WHO definition, – this is the physical, the psychological, the emotional, and the social functioning characteristic, having based on his subjective perception.

The children LQ indices dynamics examination and the study with their physically challenged possibilities, against the background of the MCR academic course passing by them, has been **the study and the research target.**

The Materials and the Methods. The 54 children with their physically challenged possibilities and their physical challenged capacities and their corresponding powers, having been specially registered, and, having passed the MCR academic course, which is being acted in the structure of «The Rehabilitation Center for the Physically Disabled Children» the STM of the Turkestan city of the South-Kazakhstan Region, have been thoroughly examined. The children LQ estimation at the age of 8-12 years has been carried out by the «PedsQL» special form, the version 4.0, having described the physical functioning (PF), the emotional functioning (EF), the social functioning (SF), and also the life at the school (LS).

We have already received a number of the significant differences, at the given research and the study stage. So, the PF under-aged children with

their physically challenged possibilities just before the MCR academic course and through the month have been authentically much better (e.g. 59,3±2,4), than just before the MCR academic course 52,2±2,5 (e.g. p=0,039). The EF under-aged children with their physically challenged possibilities just after the medical treatment have been authentically much better (e.g. 69,5±1,8), than just before their rehabilitation 55,1±2,1(e.g. p≤0,001). So, the difference between the SF under-aged children with their physically challenged possibilities at the beginning of the medical treatment (e.g. 48,8±1,9) and through the month (e.g. 54,3±1,7) has also been authentic (e.g. p=0,016). The LS under-aged children with their physically challenged possibilities has been considerably improved from 49,7±1,7 up to 52,3±1,6 just after the MCR academic course finishing, in the comparison with the given indices just before academic course beginning indices (e.g. p≤0,001).

Thus, according to the secondary school (SS) or the high school (HS) scale data, by the children themselves valuation, their LQ has already been improved with the time, against the background of the MCR academic course passing.

So, the medical and social rehabilitation (MSR) academic course is making positively its direct influence upon the under-aged children with their physically challenged possibilities the vital functions and the vital activity physical, the emotional, and the social sides, that is being revealed in all the scales indices further improvement, having characterized their LQ.

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RECOMBINATORY MORPHOGENESIS OF LYMPHATIC SYSTEM IN PRENETAL ONTOGENESIS OF HUMAN

Petrenko V.M.
St.-Petersburg State Medical Academy named after I.I. Mechnikov, St.-Petersburg, Russia

Morphogenesis of lymphatic system is the result of interactions of different uneven increasing vessels, its forms change such as structure and topography of vessels and their combinations:

1) differential morphogenesis of primary venous bed – its division on secondary veins (magistrals) and lymphatic chinks with tributaries (collaterals) after this anlage lymphatic sacs and primary vessels in the result of interactions of arteries with primary veins;

2) transformatory morphogenesis of primary lymphatic bed – its conversion into secondary lymphatic bed, when are passed anlage of lymph nodes in the result of interactions of arteries and veins with primary lymphatic vessels;

3) modificatory morphogenesis of secondary lymphatic bed – its modification by means of uneven growth and deformation of its walls with various appearence of valves and intervalvar segments, smooth myocyties. For instance pressure of aorta and its branches on some parts of thoracic duct causes increased formation of valves and smooth myocyties in these parts – they limit reverse lymph flow and support direct lymph flow. These processes can pass consecutivelly as stages of lymphatic system morphogenesis or parallelly and even in intimal relation especially last two processes. Thus morphogenesis of lymphatic system passes as process of recombination of arteries and veins and then lymphatic vessels, is manifestation of autodifferentiation of cardiovascular system when its parts enter into reinteraction including after their transformation.

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MULTI-LEVEL SEGMENTARY ORGANIZATION OF THE LYMPHATIC BED

Petrenko V.M.
St.-Petersburg State Medical Academy named after I.I. Mechnikov, St.-Petersburg, Russia

Lymphatic bed (LB) is the part of whole cardiovascular system but has specific construction. LB consists of different segments which organize flow out of surplus of tissue fluid as lymph in conditions of deficite of lymph flow energy. Multi-level segmentary organization of the LB includes its (kwazy)segmentary connection with arteries in the nerve-vascular bundles of different organs and regions of human body and fold construction of LB walls. Segments of LB can divide on general or intersystem (LB and blood bed) and special or intrasystem (intervalvar), general segments – on regional or periarterial, organic or

perinodal, root or interarteriolar. In the periarterial segment lymphatic vessels and lymph nodes take place about extraorganic arteries. In the perinodal segment lymphatic vessels from LB of this organ or its part end into the neighbouring lymph node. The root segment takes place in microcirculatory bed district: terminal arteriolae and collective venules, their branches and roots "cut" lymphatic capillaries network on parts, usually from them the lymphatic postcapillaries go out and accompany terminal arteriolae and collective venules but don t always. On each level of general, paraarterial segmentation LB divides on intervalvar segments with different construction of the walls accordingly fluctuate character of lymph flow, tissue metabolism, functional activity of organs – endothelial wall of lymphatic capillaries with mobile contacts between cells (intrawall valves) supplements then its folds with connective tissue in lymphatic postcapillaries (true, intraluminal valves), smooth myocyties in lymphatic vessels and lymphoid tissue in lymph nodes. Morphogenesis of general segments of LB is determinated by influence of arteries and growing organs (over arteries) on primary venous and lymphatic paths. In early embryos branches of aorta connect with somites which determine their segmentary direction. Arteries break up primary venous bed that leads to anlage of primary lymphatic collectors along aorta and its branches – venous pockets, lymphatic chinks and sacs with their tributaries, including the intraorganic. Anlage of lymph nodes takes place along arteries too by means of their invaginations into lymphatic sacs and vessels – thus arteries break up primary LB. Segmentation in anatomic organization of primary vascular system partily loses later in result moving of organs from their anlage places, secondary fussions of peritoneum and anothers processes, reaching to a far greater extent in the walls of LB (intervalvar segments). Growing of some organs into mesenteries of another organs in embryos and secondary fussions of peritoneum in fetuses, grow of microstructures in organs and lymph nodes, inconstancy of blood and lymph flow lead to approach and association of existent paths and formation of new, more short, including abberant paths of lymph flow from organs, beginning from root segments of LB. Morphogenesis of the root segments are determined by special features of tissue metabolism, lymphproduction as main moving force of lymph flow in roots of LB. Arteries thanks to more blood pressure in them dominate in interactions with veins and LB, contact (dividing of embryonal vessels and massage of definitive vessels) and remote (over blood flow and tissue metabolism). As origin of blood supply for all organs arteries exert determinative influence on tissue metabolism, grow of organs, lymphproduction and lymph flow, morphogenesis of LB intervalvar and general segments.

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CORRELATION BETWEEN NATURAL GROWTH AND FUNCTIONAL DEVELOPMENT OF CHILDREN (for the 90th anniversary of Ch. Child's hypothesis)

Shchurov V.A., Mogeladze N.O., Safonova A.V.
Federal State Institution «Russian Ilizarov Scientific Center "Restorative Traumatology and Orthopaedics" of Russian Medical Technologies»

On the basis of examination data of 3500 newborns for 20 years of observation it has been revealed that in case of prolonged worsening of population quality of life the decrease of body sizes occurs both in women in labor and in newborns, as well as the fall of functional maturity value of the latters. However, when economic situation stabilizes the birth rate coefficient rises and newborns' development increases selectively. The revealed phenomenon of brain development rate maintenance for body growth rate deceleration confirms Ch. Child's hypothesis of the craniocaudal gradient of fetal development.

Natural longitudinal growth of body in children and adolescents is implied by the conception of «growth», when the question concerns human beings. Under these conditions the increase of body sizes and development can't be contrasted. And, although growth is a simultaneous result of development, at some stages of life the development itself can be a growth derivative (V.V. Kupriyanov, 1974). As far as body height increased, associated with development acceleration in children in the last century, continuous renewal of the best achievements in sport was observed (G.S. Tumanian et al., 1976).

Quality of life worsening of Russia population at the end of the last century has led to the delay of children growth rate, the decrease of the values of newborn functional maturity and that of the index of schoolchildren intellectuality [V.A. Shchurov et al., 2008].

According to Ch. Child's hypothesis [1], the difficulties arising in the course of pregnancy (circulation worsening, intoxication) can have not only an overall negative effect on fetal growth, but

a differentiated one as well, under which the brain is impaired to a lesser degree. What is more, under these conditions the brain can receive an additional impulse for accelerated development. The mechanism of adaptation mentioned forms the basis of developing a thinking type of constitution which is remarkable for small body sizes and well developed brain, increased ability of environmental adaptation.

According to Arndt-Schulz law, such stress effects as trauma and hunger should depress growth rate, however, at some stages of development the non-specific component of exogenous exposure is able to accelerate getting through some phases of development [B.A.Nikitiuk, 1978; I.V.Shchurov et al., 2006]. As for the purpose of our study, we attempted to substantiate the scopes for selective development of intellectual abilities during retardation of body growth processes.

Method of Study

The values of newborn functional maturity (Apgar-1 and Apgar-2), the tests of intellectuality index determination and the values of school progress have been used to assess the degree of the brain development in children.

3500 mature infants, born in Kurgan, have been examined in complex within the period from 1988 to 2009 (every year not more than 100 persons, born in June). In addition, 95 premature infants (22-37 week of pregnancy) have been examined, as well as 245 normal children of school age, and 30 children, whose mothers are professional sportswomen. Anthropometric data, developmental values and family's financial position were analyzed. Moreover, 54 practically normal infants at the age of 17-72 weeks have been examined, and 67 children with growth and developmental deviations, associated with the pathology of pregnancy, delivery, with hereditary diseases, and being educated at infant's home.

Study Results and their Discussion

In spite of the fact that before birth a fetus has growth craniocaudal gradient [Shevtsov V.I. et al., 2003], due to which the proportion of body and head longitudinal sizes gradually decreases, comparative analysis of the longitudinal sizes of body (L, cm) and circumference of head (O, cm) in premature and mature newborns has demonstrated that there is linear correlation between them: **O = 0.715*L – 1.86; r =0.992**.

In postnatal period the rate of head size increase becomes relatively less. In newborns the measures of functional maturity by Apgar-1 and Apgar-2 scale increase, as far as head circumference increases up to optimal values (34-36 cm). Further increase of head sizes is of pathological character and doesn't lead to adequate increment of functional maturity value (Fig. 1).

After 1988 the social-and-financial position of the population in the majority regions of Russia has been worsened. The delay of women's body growth (Fig. 2), the decrease of their pelvis sizes, body sizes of newborns, and 4-7% reduction of the values of their functional maturity – all this has become a result of such worsening of life quality. There was formed a tendency towards the improvement of economic measures in the population life in the last decade. Besides, the coefficient of birth rate increased from 9‰ to 11.6%, the percentage of pregnancy loss decreased from 7.6±0.5 to 3.8%±0.2 ($p \leq 0.05$).

In the presence of this background the increase has been revealed concerning Apgar-1 and Apgar-2 values of functional maturity in newborns of Kurgan; in 1998 these values amounted to 7.21±0.09 and 8.35 ±0.07 points, respectively, and in 2009 they reached 7.35 ±0.07 and 8.63±0.06 ($p \leq 0.01$). This increment occurred through continuing deceleration of children body growth rate (Fig. 3). That is to say,

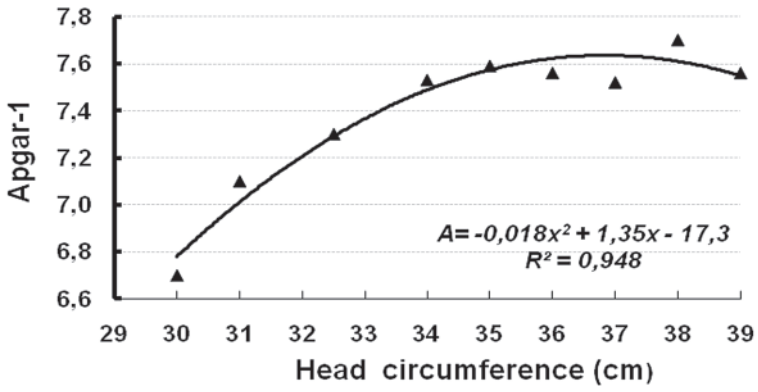

Fig. 1. The plot of Apgar-1 value against head circumference in normal newborns

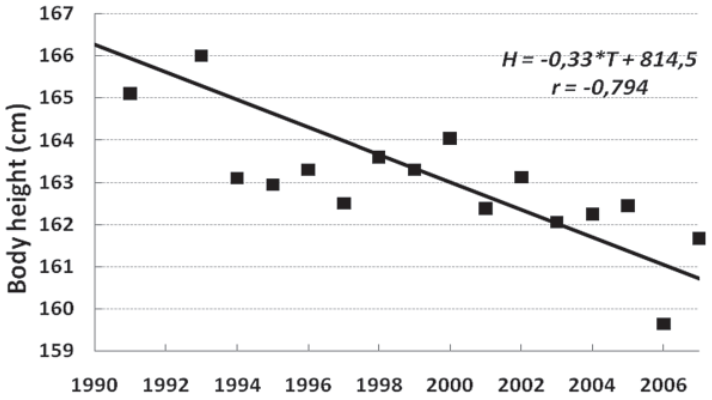

Fig. 2. The dynamics of longitudinal sizes of women-in-labor' body on a basis of 18-year-old age achievement

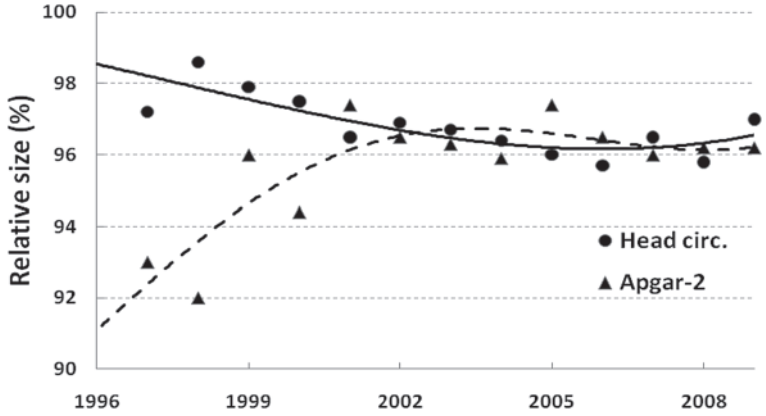

Fig. 3. The dynamics of head circumference decrease and recovery of Apgar-2 value in children with respect to the level of 1988

the increase of birth rate and development rate took place at the expense of body growth deceleration. Hence, the decrease of body sizes is a form of adaptation under the conditions of nutrition quality worsening, which contributes to the recovery of functional development level in children and to that of population reproductive potential.

We tried to analyze the cases of differently directed dynamics of head growth rate and brain development. Gender-related differences represent the first exception. In girls head size is 1.3% less, and Apgar-1 and Apgar-2 values are unreliably higher (1.3% and 2.3% higher, respectively).

The second exception is represented by professional sportswomen. In sportswomen body mass is relatively less (Quetelet index is 0.37 and 0.44, respectively). Probably, a motor dominant is able to have a negative effect on a gestational one, to lead to limitations in meeting fetal needs, to deceleration of its growth rate. Head circumference of newborns in the group of mothers, who were not sportswomen, was 35.2±0.07 cm on the average, in women going in for sport – 34.4±0.3 cm (p£0.05). However, children in sportswomen are born with higher Apgar-1 value (7.6±0.05 and 8.2±0.11 points, respectively, (p£0.001). The level of school progress of sportswomen' children in the first form was 13% higher. This advantage in development rates was gradually lost by the end of primary education.

In children with CNS pathology, who were abandoned by their parents, after birth longitudinal sizes and body mass were decreased in comparison with normal children of the same age. Normally the height of a 3-years-old child is 91.7 ±0.8 cm and body mass – 13.6±0.2 kg, while in case of developmental retardation it is 82±0.9 cm (89%, $p<0.001$) and 10.6±0.2 kg (78%, $p<0.001$), respectively. Myocardium mass in control and experimental groups was 37±1 g and 34.4±1 g, respectively. At the same time, myocardium mass correlated with body mass

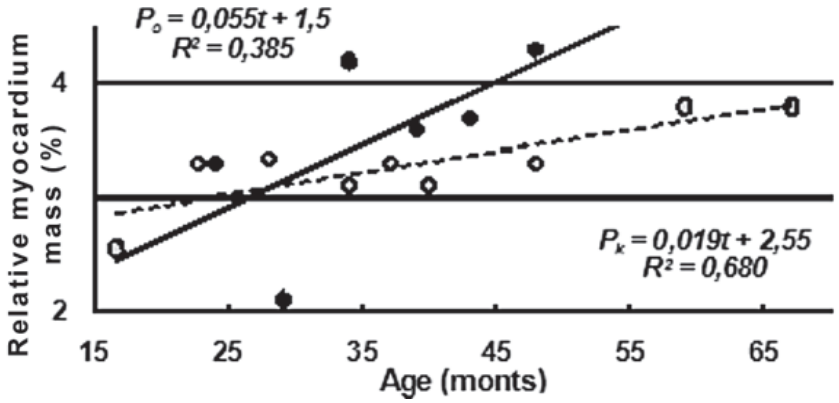

Fig. 4. Age-related dynamics of heart relative mass of the subjects examined in control (open circles) and experimental (full circles) groups

was higher in the subjects examined in experimental group with growth and development retardation (Fig. 4). Such a dynamics makes it possible to hope that in children of experimental group making up for growth rate may occur provided timely creation of favourable conditions.

Thus, when quality of life moves up to another level under the conditions of economic crisis, dragged on for many years, the restoration of women's reproductive function and newborns' functional maturity is realized at the expense of adaptation, connected with the decrease of organism metabolic needs by decreasing its growth rates, thereby resulting in body mass reduction. That kind of process direction stands in opposition to the tendency towards perishing the population of country regions. The regularity revealed (birth rate rise through body size decrease for protein-calorific deficient diet) reflects general biological principle of species preservation in stabilization of unfavourable external factors of life.

Conclusion

The tendency towards restoration of women's reproductive function in the last century is not so much connected with changes in life quality of population as with the population's adaptation to the social-and-economic conditions created, which has specifically manifested itself in deceleration of natural longitudinal body growth.

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Short Report

COMPLEX DIAGNOSTICS IN PATIENTS WITH COLONIC POLYPS AND POLYPOSIS

Navruzov S.N., Sapaev D.A., Mamatkulov Sh.M., Sapaeva Sh.A.
Republican Coloproctology Research Center, Tashkent Medical Academy

Diagnostics and treatment of colonic polyps and polyposis are the issue of today due to steady growth of the number of new cases. Most of researchers adhere to the opinion, that polyps are precancerous condition and tumors go through long stage of adenomatous polyp and 95% of malignant tumors develop from adenomatous polyps, and their removal is the way to prevent cancer [3, 9, 10, 13, 15, 19]. At the same time, regardless to surgical and conservative treatment the recurrences of the disease, complications leading to severe suffering of patients and hesitance in curability of it are quite frequent [1, 4, 11, 18, 20, 25, 28]. This is related to different factors, amongst which the genetic predisposition to development of colonic polyps and polyposis (CPP) and colonic cancer is believed to be one of the most important [5, 6, 8, 14, 26, 27].

In the context of the modern diagnostics of colonic polyposis, prognostication of malignization of polyps and choice of adequate surgical tactics, and issues of complex diagnostics of the disease on different levels of health care system, including rational use of modern diagnostic methods are important issues.

Objective

Development of diagnostic and prognostic criteria of severity of the disease and the risk of malignization of colonic polyps for health care institutions of different levels, using modern diagnostic methods (virtual colonoscopy, methods of molecular genetics).

Materials and methods

There are analyzed the diagnostic and treatment outcomes of 183 patients with colonic polyps and polyposis treated at the Republican Coloproctology Research Center (RCPRC) and Republican Oncology Research Center (RORC) of the Ministry of Health of Uzbekistan in 1998-2008.

The diagnosis of colonic polyps and polyposis has been made based on the outcomes of clinical-instrumental and laboratory tests based on the classification of V.D. Fedorov, 1983.

Forms and stages of the diffuse colonic polyposis were differentiated in line with recommendations of V.P.Rivkin, 2006 and based on morphological analysis of biopsy specimens of colonic mucosa.

For diagnostic purposes all examined patients undergone complex clinical-instrumental examination, which included endoscopy, X-ray examination, including virtual colonoscopy (VC) multispiral computed tomography (MSCT) using the device of PHILIPS. There were also performed clinical blood and urine tests, as well as biochemical blood assay.

Genetic part of the survey has been done in 64 patients with different forms of polyps and polyposis and in 20 healthy volunteers with unburdened genetic background.

Genetic research has been done in collaboration with the Laboratory of Human Functional Genomics at the Institute of Genetics and Embryology of Uzbek Academy of Sciences. DNA from the tissue specimens has been isolated using Wizard Genomic DNA Purification Kit (Promega, США) following the producer instructions. For PCR-amplification of fragments of the genes being analyzed the appropriate primers have been used.

Results

The age of patients ranged from 14 до 78. There were 111 (60.7%) males and 72 (39.3%) females (Table 1). Ratio of males and females made 1.54:1.

Duration of disease varied in wide range. Duration from 1 month to 1 year was in 36 (16,7±2,9%) patients, from 1 to 2 years – in 65 (35,5±3,5%), from 2 to 3 years – in 32 (17,5±2,8%), more than 5 years – in 34 (18,6±2,9%) patients. Duration of the disease up to 1 year was mainly in patients with solitary polyps and juvenile form of diffuse polyposis, from 1 to 2 years – in patients with hyperplastic form, 2-5 years – with adenomatous and adenopapillomatous form.

Solitary polyps are found in 52 (28,4±3,3%), multiples – in 45 (24,6±3,2%), diffuse colonic polyposis – in 71 (38,8±3,6%) patients, out of them Peuta-Jeghers syndrome was found in 13 (7,1±1,9%); in 15 (8,2±2,0) patients malignant polyposis of colon has been found.

By the level of dissemination of polyps the patients are distributed as follows: distal lesions in 135 (73,8±3,3%), left part of colon in 18 (9,8±2,2%), subtotal in 7 (3,8±1,4%), total in 23 (12,6±2,5%) patients. Mild cases were found in 62 (33,9±3,5%) patients, moderate – in 78 (42,6±3,7%), severe – in 43 (23,5±3,1%).

Distribution of patients by forms and stages of diffuse polyposis of colon: proliferating diffuse polyposis has been found in 35 (19,1±2,9%) patients, out of them I (hyperplastic) stage – in 25 (13,7±2,5%) patients, adenomatous – in 78 (42,6±3,7%), adenopapillomatous polyposis – in 54

Table 1

Distribution of patients by sex and age, n=183

Age of patients, years	Males		Females		Total	
	abs.	%	abs.	%	abs.	%
Under 20	5	2,7	4	2,2	9	4,9
20-29	26	14,2	20	11,0	46	25,2
30-39	15	8,2	4	2,2	19	10,4
40-49	21	11,5	21	11,5	42	23,0
50-59	24	13,1	20	11,0	44	24,1
60 and older	20	11,0	3	1,5	23	12,5
Total	111	60,7	72	39,3	183	100,0
Average age	43,7±1,45		39,7±1,56		42,2±1,08	

(29,5±3,4%). According to publications data while making biopsy it is important to pay attention to the technique of sampling and histological sections preparation [1, 7, 15, 18, 21, 31]. While biopsy sampling during colonofiberscopy, it is important to make electroscission at polyps peduncle with minimal traumatizing of its rest parts. While taking a sample the excisions has to include the end, peduncle and base of the polyp. The main clinical features of polyposis included symptoms of intoxication, extraintestinal and gastric manifestations (Table 2). The most frequent symptoms were: melena (65,6±3,5%), general weakness (59,6±3,6%), abdominal pains (28,4±3,3%), weight loss (24,6±3,2%), anal pains (16,4±2,7%).

Amongst the complications the most frequent ones were hemorrhages (36.6±3.6%), hemorrhagic anemia (29,0±3,4%), abdominal pain syndrome (27.9±3.3%) (Table 3).

Molecular-genetic research helped to find out, that the diffuse colonic polyposis syndrome is

Table 2

Main clinical manifestations of colonic polyps and polyposis, n=183

Claims	Number of patients	
	абс.	%
Intestinal manifestations:		
– melena	120	65,6±3,5
– abdominal pains	52	28,4±3,3
– bleeding	67	36,6±3,6
– presence of pus and mucus	16	8,7±2,1
– tenesmus	11	6,0±1,8
– meteorism	8	4,4±1,5
– diarrhea	2	1,1±0,8
– constipation	2	1,1±0,8
Intoxication symptoms:		
– general weakness	109	59,6±3,6
– weight loss	45	24,6±3,2
– dizziness	17	9,3±2,1
– dry mouth	2	1,1±0,8
Extraintestinal manifestations:		
– anal pains	30	16,4±2,7
– prolapse of polyps during defecation act	9	4,9±1,6
– availability of formation in anal part	4	2,2±1,1
– liquid stools and gas incontinence	3	1,6±0,9
Gastric manifestations:		
– appetite loss	8	4,4±1,5
– nausea	2	1,1±0,8
– vomiting	2	1,1±0,8

Table 3

Complications of the underlying disease in patients with colonic polyps and polyposis, n =183

Complications	Number of patients	
	Abs.	%
Bleeding	67	36.6±3.6
Hemorrhagic anemia	53	29.0±3.4
Abdominal pains symdrom	51	27.9±3.3
Chronic colonic obstruction	18	9.8±2.2
Malignization	15	8.2±2.0
Cachexy	9	49±1.6
Strictures	9	4.9±1.6
Acute colonic obstruction	8	4.4±1.5
Pericolic abscesses	5	2.7±1.2
Perforations	2	1.1±0.5
Paraproctitis	1	0.5±0.5

caused by germinal mutation of the suppressor gene of the tumor – APC (Adenomatous polyposis coli). Besides, APC has the oncogene function, because some mutant forms of APC not only lose their normal function, but become able to fix and inactivate normal APC protein. Occurrence of the somatic mutation in a normal allele leads to inactivation of both alleles and occurrence of sporadic colorectal cancer cases [5, 6, 8, 14, 16].

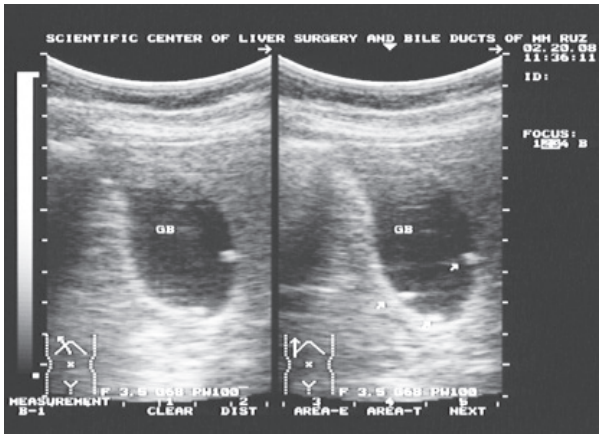
Out of 64 genetically tested patients mutation in APC gene has been found in 51 (79.7±5.0%), in such a case, the frequency of its occurrence depended on the form of the disease. In 5 patients there were solitary, in 15 – multiple and in 44 – diffuse polyps, and out of the latter the Peuts-Jeghers syndrome was found in 11. In 16 patients there were found distal, in 8 – left side, in 6 – subtotal and in 34 – total affection of colon. Status of 10 patients was qualified as light, 20 patients – moderate, and in 34 patients as severe. 27 patients have undergone different operations on the occasion of multiple polyps and polyposis. In 27 patients there were found concomitant diseases (cardiovascular, lung, liver, gastro-intestinal tract and endocrine system). In 9 patients there was revealed malignant polyposis.

Availability of mutations of APC gene made significant influence on the course of the pathologic process. Thus, there were no mutations of APC gene found in patients with light course of disease. In patients with moderate and severe course the frequency of mutations made 85.0±8.0% and 100.0±0.0% accordingly. There is also revealed the connection between the frequency of mutations and the extent of the pathologic process: in cases with distal and left side spread of polyps the frequency of mutations was 56.3±12.4 и 75.0±15.3%, whereas in cases of subtotal and total affection of colon – mutations were found in all examined patients (100.0±0.0%). Also if in absence of mutations there were mainly affected distal parts of colon, polyps were of small size and no complications of the underlying disease were found, in patients with mutations there was found subtotal and total affection of colon, with polyps in shape of "bunch of grape", big size polyps on the flat base. In patients with mutations in APC gene, especially those with Peuts-Jeghers syndrome, there was found total affection of colon with development of constrictions, malignization, polyps in shape of "bunch of grape". Quite frequently there was noted cachexy, posthaemorrhagic anemia. All the abovementioned indicate that molecular-genetic testing has to be included to the compulsory diagnostic complex of testing in cases of colic polyps and polyposis. It will allow to improve the results of surgical treatment, facilitating choice of adequate operative tactics. In patients with mutations in APC gene (mainly in cases of Peuts-Jeghers syndrome) there was also found affection of upper parts of gastro-intestinal tract and gallbladder with polyps.

According to results of ultrasound scanning in 2 out of 11 patients with Peuts-Jeghers syndrome there were found polyps of gallbladder (Picture).

During colonofiberscopy and irrigography in patients without mutations in he gene there were found mainly lesions of distal parts of colon, while in patients with mutations in the APC gene there were found the signs of toxic dilatation, stricture, filling defects and "bovine eye" syndrome.

Thus, in patients with multiple and diffuse polyposis, especially those with family polyposis and Peuts-Jeghers syndrome the APC gene mutations are found with high frequency (up to 100%) There is definite connection between availability of mutations



in APC gene and inherited predisposition, course of the pathologic process, its extent of spread, clinical manifestations and complications.

Discussion of the results and justification of the complex diagnostic's algorithm

The main screening principles are based on 3 principles: while making decision on the method and time of starting the screening the family and individual risk factors have to be evaluated; physician has to recommend the further examination in case of positive results of screening; patient has to be informed about both positive and negative sides of each test, in order to make informed choice.

One of the most accessible screening methods is occult blood feces analysis. However, according to literature [2, 3, 4, 15, 16, 19], its sensitivity in patients with colic polyps and polyposis does not exceed 50%. According to our data it is between 0 and 17.6%, depending on the size of polyps: 0-1% in polyps up to 1 mm, 8-17% – in polyps from1 to 7 mm, and 17.6% – when the diameter of polyp is more than 8 mm. Besides the specificity of this method, according to our data, is 7.2% in polyps with diameter of 1-7 mm, and 11.3% in cases when diameter iss 8 mm and bigger. The diagnostic accuracy is 1% in diameter of the polyp up to 1 mm; 3% if diameter is 1-7 mm, and 9% if diameter is 8 mm and higher.

The other widely used method - sigmoidoscopy, exceeds in its sensitivity the previous one. In polyp sizes up to 1 mm, 1-7 mm, 8 mm and more it constitutes accordingly 3-8, 18-31 and 58,2%, specificity of this method is – 2,1; 22,4 and 61,5%, and diagnostic value – 4, 18 and 31%. From the other side sigmoidoscopy in cases of big polyps and strictures does not allow examining the small intestine and colon fully, besides it is quite painful procedure, which frightens patients.

Colonofiberoscopy is the third by its information value instrumental method. [12, 15, 20, 24, 28, 29]. According to our data sensitivity of this method makes 28-42, 60-70 и 87,5%, specificity – 58,3; 64,5 и 90,1%, and diagnostic preciseness – 53,6; 70,3 и 80,7%, in cases of size of polyps up to 1 mm, 1-7 mm, 8 mm and higher – accordingly. The method of course requires thorough preparation of the patient, full cleaning of colon. Quite often there are noted false-positive results and impossibility of morphological diagnostics. One can speak about successful colonofiberscopy only in case of reaching by the device to head of blind colon. However if there is a stricture and colon deformation, the diagnostic possibilities and value of the method are significantly reduced. At the same time colonofiberscopy does not provide information about the internal structure of polypoid formations and does allow identifying the depth of invasion of the malignant tumor to the colic wall, its invasion to neighboring organs, as well as about the condition of regional lymphatic nodes.

Since 1994 for diagnostics of colonic lesions there is successfully used non-invasive method VC, based on analysis of multiple sections, obtained using CT scan [22, 23, 27, 30, 31, 33, 32, 34, 35, 36]. Our results have shown, that in cases with polyps size less than 1, 1-7 mm, 8 mm and more the sensitivity of VC makes respectively 75-80, 100 and 100%, specificity – 85,1; 98,6 and 100%, diagnostic accuracy – 95,3; 100 and 100%. At the same time, this method cannot allow to receive biopsy material from lesion focus and make morphological investigation.

While developing the algorithm of the complex diagnostic of polyps and polyposis we proceeded from the following principal requirements:

1. All levels of the health care system have to be involved to the complex diagnostic process – primary health care (GPs at rural doctor's stations and city family polyclinics), secondary care facilities (central rural and town polyclinics and hospitals), tertiary care (regional and republican specialized coloproctology centers).

2. Available diagnostic methods have to be applied taking into account both the level and

possibilities at health care facilities, as well as the individual patient's condition.

3. Complex diagnostics has to help to divide patients into groups, according to severity and spreading of the process, which identify the tactics of surgical and rehabilitation treatment. In this aspect the identification and forecasting of malignization of polyps is crucial.

Based on the results of our long-term observation and analysis of global experience, as well as taking into account the abovementioned requirements, we divided the patients into 4 groups, based on the disease severity and colic polyp's malignization risk levels. We developed the complex of diagnostic and prognostic criteria for evaluation of severity of disease and malignization risk for different level health care facilities (Table 4).

While developing the complex we identified at first the 4 risk groups for malignization – minimal, moderate, significant and high, based on the need to apply different surgical tactics in each of them. There were developed main clinical criteria for identification with special focus on number and size of polyps, as well as their minute structure.

Table 4

Complex of diagnostic and prognostic criteria to identify the severity of disease and malignization risk of colic polyps

Clinical criteria	Number and sizes of polyps	Histology	Diagnostic methods
1 group – minimal risk of malignization			
Clinical signs: blood in feces, anemia, possibly tenesmus and dropping out polyps during defecation act, family anamnesis, general symptoms (anemia, weight loss, abdominal pain, anal pain etc.)	Solitary polyps with size no more than 5-8 mm, up to 10 units, rectum is affected more frequently	Adenomatous and villous polyps are prevailing	Primary health care facilities: «hemoccult test», Secondary health care facilities (surgical depatrments): + oesophagogastrodudenofiberoscopy, anoscopy, rectoscopy, biopsy
2 group – moderate risk of malignization			
Pathologic discharge and frequent liquid bloody stools, in combination with abdominal pain and meteorism, post hemorrhagic anemia, possibly tenesmus and drop-outs of polyps during defecation act	Multiple polyps with size no bigger than 15 мм, up to 50-100 units, more frequently rectum and distal part of sigmoid colon is involved	Proliferation, hyperplastic stage of polyposis	Secondary and tertiary health care facilities (proctology units): Oesophagogastroduodenofiberoscopy, colonofiberoscopy, biopsy, preferably virtual colonoscopy
3 group – significant risk of malignization			
Pathologic discharges, frequent fluid bloody stools, combined with abdominal pain, meteorism, post hemorrhagic anemia, and cachexia	Diffuse polyposis, initial stages of Peuts-Jeghers, Trucot, Gardner syndromes, polyps no bigger than 15-30 mm, 100-500 units, affection of rectum and colon	Adenopapillomatous stage of diffuse polyposis with proliferation and dysplasia foci in epithelium of polyps with various manifestation degrees	Republican coloproctology and oncology centers: oesophagogastroduodenofiberoscopy, colonofiberoscopy, biopsy, virtual colonoscopy, preferably molecular-genetic research (APC, PCR)
4 group – high risk of malignization			
Young age, family predisposition, presence of pigment and lentiginosis spots on the red border and hand fingers, enteric manifestations, anemia and cachexy	Total diffuse colic polyposis, intestinal polyposis (Peuts-Jeghers, Trucot, Gardner syndromes)	Peuts-Jeghers polyps with malignization or transformation of carcinoma in situ into adenocarcinoma within mucosa and myenteron	Republican proctology and oncology departments and centers, oesophagogastroduodenofiberoscopy, colonofiberoscopy, biopsy, virtual colonoscopy, oncomarkers: carcinoempryonal antigen, molecular-genetic tests (APC, PCR)

For each risk group there were identified diagnostic methods, relevant to the specific health care facility to ensure continuity in the process of examination of patients on all levels – from primary up to tertiary one. It facilitates timely send patients to the relevant facility – starting from family doctors and ending by the level of specialized proctology and oncology centers. Special emphasis has been done in the groups of moderate and especially high risk groups for use of the most up-to-date methods – virtual colonoscopy (VC) and PCR. VC, being the most high-informative and valuable method in diagnostics of polyps and polyposis, at the same time is still quite expensive and does not provide full answer in terms of extent or risk of malignization. Complementing it with PCR allows to assess the degree of malignization and, accordingly, to have more differential approach to the choice of surgical treatment tactics.

Conclusions

1. Early diagnostics and effective treatment of patients with colic polyps and polyposis requires improvement of screening and diagnostics system on all levels of health care system – starting from GPs and ending by coloproctologist and oncologists working at republican specialized centers – through identification of risk groups on the basis of both severity and malignization risk criteria.

2. In order to make efficient choice of the best surgical tactics in patients with colic polyps and polyposis, the complex of diagnostic examination of these patients has to contain modern high-informative non-invasive diagnostic methods, including the ones of molecular genetics for forecasting malignization processes, as well as virtual colonoscopy for assessment of extent and character of a lesion.

3. The developed complex of diagnostic and prognostic criteria of disease severity and risks of malignization of colic polyps meets all necessary requirements of early and effective diagnostics, and can be recommended for wide implementation in health care facilities of all levels.

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THE PECULIARITIES OF FORMING TIPES OF CUTTING DOWNS AFTER COMMON FELLS OF MAIN USING

Savchenkova V.A.
Bratsk State University Bratsk Russia

In this article discussed the problems of influence alive soil coveres for forming of growth after common cuttings. Marked the groups of buch and grass planting. Received the mathematical models, which describe the dependence a planting coating of forest types of grass plants group of types cutting down.
Keywords: growth, alive soil coveres, types of grass plants, natural restocking, forests types, deforestation types.

Field layer influences initial stages of forming the forest. There have been made research at constant and temporary sample plots to learn the dynamics of field layer changes on different types of slashes. The research was carried out with the help of standard methods with descriptions of fruticulose-herbascent and mossy-lichen plants, their projective cover, abundance, species vitality, distributional pattern. In accordance with the findings there've been made a comparative analysis.

Annual observations allow finding out the dynamics of slash coverage of a group of plants, determine the reproduction principles connected with the dominant species of herbaceous vegetation all plants may de assembled in ecological groups. Lashchinsky N.N. separated groups (elements) based on the structure of pinery flora, orienting at phytocenotic behavior, development rhythm, vitality of a specie in coordination of mainly within Western and Central Syberia and with account of pine and birch range.

On the basis of the materials of analysis of sample plots there have been separated 6 groups of fruticulose-herbascent vegetation, volume ratio of which reflects the condition of life soil mantle forests of Central Angara region:

1 group – forest xerophytes,
2 group – forest hylophytes,
3 group – pratal xerophytes,
4 group – pratal hylophytes,
5 group – brook hygrophyte,
6 group – swamp hygrophyte.

For the first group such species of herbascent vegetation as Peltigera aphthosa, Cladonia sylvatia, bearberry Arctostaphylos uva-ursi L.Spreng, Antenaria dioica L. etc. are common.

For the second group Aconitum volubile Pallas ex Koelle, Calamagrostis obtusata Trim, Crepis sibirica L., Lathyrus sylvestris L., Maianthemum bifolium, Ramischia secunda (L.) Garcke, Linnaea borealis L., Pleurozinm schreberi, Hylocomium splendens, Dicranum polysetum etc. are common.

A group of pratal xerophytes and hylophytes was formed in accordance with the classification of A.P.Shennikov (1938) and taking into account L.I.Namokonov's suggestions (1959).

In grass canopy of pratal xerophytes and hylophytes there's a great number of plants typical to wood and woodside communities.

The group of pratal xerophytes and hylophytes in herbal wood formations is presented by 45-50 species of higher plants. Basically their dispersal is connected with the human business activity.

In the group of brook hygrophyte Cacalia hastate L., Trolius asiaticus L., Impatiens noli-tangere L., Scrophularia nodosa L., Lilium pensylvanicum Ker-Gawler, Carex cespitosa, C. Media R.Br., C. Riparia Curtis and etc. are dominated.

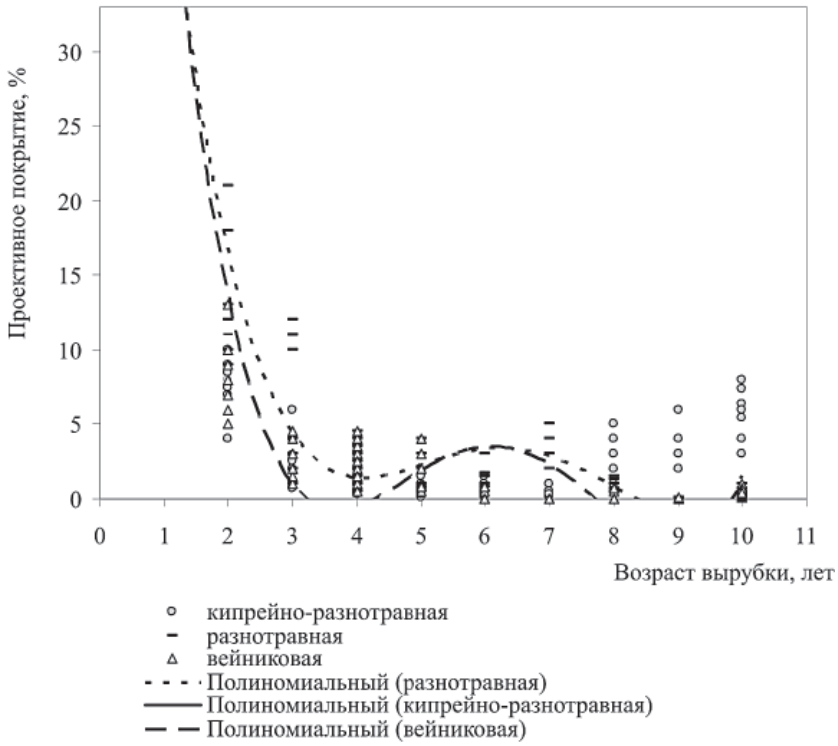
A group of swamp hygrophyte is presented by Spiraea salicifolia L., S. Media, Carex pauciflora L., C. Dioica L., Calla palustris, Senecio congestus, Parnassia palustris, different types of Sphagnum and etc.

Human business activity conduces to meadow vegetation penetration into wood grass formations and also to temporary disappearance of wood grass veg-

etation. Human activity doesn't influence hand-reared and swamp communities as they all are mostly poor stand in which tree felling is carried out. In connection with this a close research of the first four communities on different types of slashes has been carried out.

Changes of projective cover of forest herbaceous plants at willow herb, grass and reedgrass slashes at the age up to 10 years is presented in picture 1.

In pic. 1 we can see sudden fall of forest herbaceous plants quantity after final cuttings at willow herb type of slash (projective cover up to 1-2%) and complete die-off at grass (up to 25% of the total area of research slashes) and reedgrass type of slash (up to 70% of the total area of research slashes).



Pic. 1. Change dynamic of projective cover of forest herbaceous plants at willow herb, grass and reedgrass slashes at the age up to 10 years

According to floristic composition and storied construction ground vegetation in young stock of willow type of slashes differs from reedgrass and grass by less coverage and gramineous plant frequency.

Approximating data by biquadrate polynominal gives formula:

– for willow-herb type of slash (R^2=0,9312)

$$Y = 0{,}0867 \cdot X^4 - 2{,}1901 \cdot X^3 + 19{,}718 \cdot X^2 - 73{,}922 \cdot X + 97{,}328 ; \quad (1)$$

for herb type of slash (R^2=0,9442)

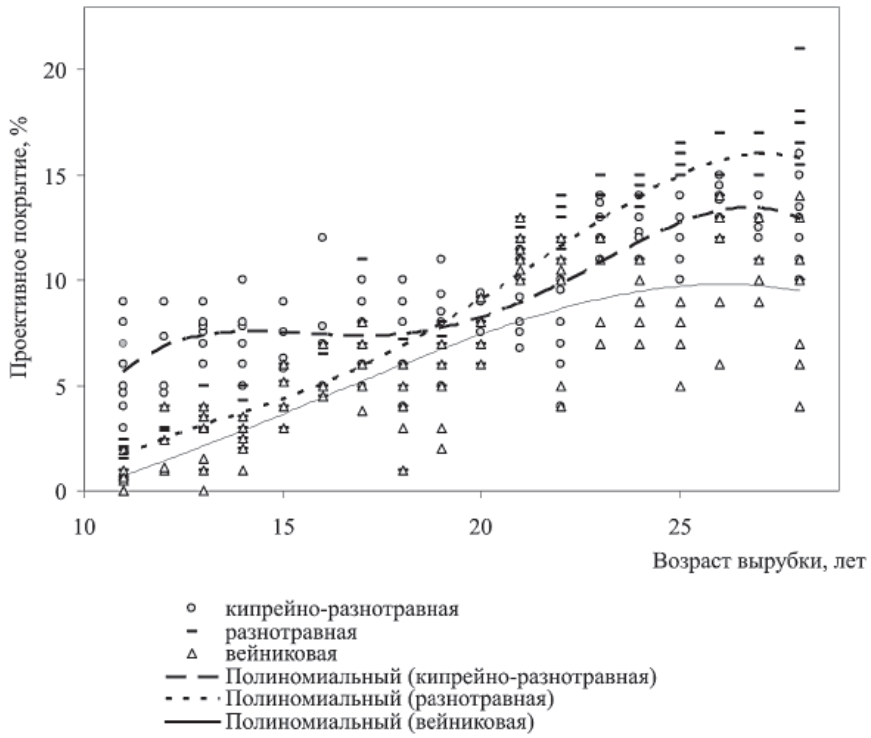
$$Y = 0{,}0741 \cdot X^4 - 1{,}9292 \cdot X^3 + 17{,}856 \cdot X^2 - 69{,}51 \cdot X + 98{,}246 . \quad (2)$$

Coefficient of determination allows coming to a conclusion that at willow-herb, grass and reedgrass types of slashes up to 10 years old biological projective cover with

forest plants 92-94% depends on type and age of a slash and 6-8% on other factors, impact of which is insignificant. The research showed that it is connected with the increase of light level after weeding main canopy at one go as forest herbaceous plants, growing under forest stand canopy, are in different extent skiophilous.

At the age of 10 years gradual recovery of forest types of grass vegetation is seen. Green moss is recovered under the canopy of meadow grass and tall grass vegetation.

Changes of projective cover of forest herbaceous plants at willow herb, grass and reedgrass slashes at the age over 10 years are presented in picture 2.



Pic.2 Change dynamic of projective cover of forest herbaceous plants at willow herb, grass and reedgrass slashes at the age over 10 years

It is seen in picture 2 that at willow-herb, grass and reedgreen slashes forest species recover very slowly. The processes are almost the same. Reedgrass types of slashes recover with valuable species the most protractedly and weakly – less than 1,0 thous/ha. It is connected with a strong ramping of soil level.

As the research shows reedgrass negatively responds to the tree species shading whereupon at the age of 15-18 years its quantity is falling. There's no grass vegetation growth. A species composition and storied construction typical to the slashes remained in grass- fruticulose story of reedgrass slashes 16 years after the cutting.

The projective cover of slashes with the forest herbaceous plants is up to 20% concerning the cover under canopy of cut trees at 28 year-old slashes. It is the maximum age of the research, as it's the period when timber stockpiling started in the region of Angar.

The obtained math models, describing the relation between projective cover with forest herbaceous plants and the age of a slash, we can get the following formula:

– for willow-herb type of slash (R^2=0,649)

$$Y = -0{,}0013 \cdot X^4 + 0{,}99 \cdot X^3 - 2{,}7554 \cdot X^2 + 33{,}036 \cdot X - 137{,}35 . \quad (3)$$

– for herb type of slash (R^2=0,8812)

$$Y = -0,0006 \cdot X^4 + 0,0413 \cdot X^3 - 1,0256 \cdot X^2 + 11,522 \cdot X - 47,25 . \quad (4)$$

– for reedgrass type of slash (R^2=0,6638)

$$Y = -2E - 0,5 \cdot X^4 - 0,0011 \cdot X^3 + 0,0822 \cdot X^2 + 0,6671 \cdot X - 0,0783 . \quad (5)$$

Coefficient of determination allows coming to a conclusion that at grass types of slashes up to 10 years old biological projective cover with forest plants 88% depends on type and age of a slash and 12% on other factors, impact of which is insignificant. And at willow-herb and reedgrass types of slashes – 64-66% depends on type and age of a slash and 34-36% on other factors. The research showed that durable soil ramping influences the recovery process. And we come to a conclusion that to reduce period of growing of economically valuable species at willow-herb and reedgrass types of slashes additional action is needed for forest recreation.

Materials of Conferences

PHARMACOLOGICAL PROPETIES OF NEW DERIVATIVE GABA

Grazhdanceva N.N.[1], Samotrueva M.A.[1], Turenkov I.N.[2], Hlebcova E.B.[1], Ogyanesyan E.T.[3], Codonidi I.P.[3]

State educational institution of higher professional education "Astrakhan state medical academy"[1], Astrakhan, Russia

State educational institution of higher professional education "Volgograd state medical university"[2], Volgograd, Russia

State educational institution of higher professional education "Pyatigorsk state pharmaceutical academy"[3], Pyatigorsk, Russia

Nowadays by immune physiologists there was proved the most important role of neuroimmune connections in normal and pathological homeostasis of organism. The obvious interest is caused by perspective direction by the creation of new substances at the base of structural analogues γ-aminobatyric acid, which have neuroimmunetropic behaviors. In this work there are represented results of text tests of immune pharmacological behaviours of new derivative γ-aminobatyric acid PDE-GABA

The experiment was carried out at the 48 mouses of line CBA at the age of 3-4 months. Animals were divided into following groups: control – animals, which receive physiological solution and experiment – animals, which receive PDE-GABA at the dose of 35 mg/kg intraperitoneally during three days. The influence of PDE-GABA to the cell and humoral links of immune answer there were examined at the reactions of hypersensivity of slow type (RHST) and passive hemagglutination (RPHA) accordingly. There also was assessed the influence of examined substance to the mass and cellularity of immune competent organs. At the series with the RHST and RPHA the examined substance was interacted simultaneously with the immunization with red blood cells of sheep, and also with an interval in one day before and after immunization. Experimental work was carried out with the taking into account of International principles of declaration of Helsinki. While the comparison of indicators of experiment and control groups there was used a method of variative statistic.

During the experiment there was stated that examined substance under the laboratory code PDE-GABA while the intraperitoneal introduction at the dose of 35 mg/kg during 3 days takes simulated at the relations of cell and hymoral immune reactivity: the index RHST and titre of antibodies in RPHA raise the indicators of control group more than by 35%. It was revealed the stimulating action of PDE-GABA to the proliferative process at the organs of immune system: the mass of spleen and thymus exceeds the control meanings more than by 20%, the number of splenocyte and thymocites more by 60%.

Therefore, received during the experiment results testify to the presence in new derivative GABA – PDE-GABA – immune stimulating behaviors, what indicates to the currency of further researches by the studying of immune modulating actions of substance.

The work was submitted to the scientific interational conference "Fundamental researches", Israel, 10-17 April, 2010. Came to the editorial office 18.03.2010.

THE INFLUENCE OF SULFUR-CONTAINING GAS ON MALONDIALDEHYDE LEVEL IN WHITE RATS BLOOD PLASM

Teply D.L.[1], Mazhitova M.V[1]., Trizno N.N.[2]

[1]Astrakhan State University

[2]Astrakhan State Medical Academy

In organisms during all evolution there were produced protective systems, which are summon to safe optimal level of self-radical processes, which changes while different interactions. Astrakhan gas processing complex (AGPC) takes special place among the industrial enterprises of region. From the sulfur-containing discharges of AGPC, the biggest danger for health of population has hydrogen sulfide, which has expressed toxic action to the whole organism. In spite of that fact that hydrogen sulfide has a restoration activity, during its transformation, in the organism there formed active oxygen metabolites and there are strengthen the processes of peroxide oxidation.

The aim of our research was to define the content of final product of peroxide oxidation of lipids (POL) malondialdehyde, and also spontaneous ascorbatedepending speed of POL at the plasma of blood of white rats after chronic inhaler influence with sulfur-containing gas of Astrakhan deposit.

Theresearch was carried out at the fall-winter period of 40 animals of different sex, with the average mass of 180 g, which were contained in standard

conditions of vivarium. The inhalation with sulfur-containing gas at the dose of 150 mg/m^3 was carried out during one and a half of month five days a week 4 hours a day. POL at the plasma of blood was defined spectrophotometrically by the method which is based on the reaction of malondialdehyde with thiobarbithuric acid with the forming of tinctured trimethadione complex.

The analysis of changing the level of malondialdehyde showed the increase of contents of this product both in males ($P < 0,001$), and females ($P < 0,001$). But males have more sharp increase of level of MDA (by 200%), then females (≈ by 63%). The speed of spontaneous and ascorbate depending POL became reliably higher at the phone of influence independently from the gender of animal. Thereby, the results of our research indicate the breach of balance at the system pre- and antioxidants in animals, what testifies that one of the damaging organisms of hydrogen sulfide is strengthening of link self-radical oxidation of different structures of cell membranes and subcellular formations.

The work was submitted to the International Scientific Conference «Fundamental research», Israel, Tel Aviv, 10-17 April, 2010, came to the editorial office on 18.03.2010.

INDIVIDUAL RESOURCE OF PROFESSIONAL DEVELOPMENT AS A NECESSARY CONDITION OF BECOMING OF PROFESSIONALISM

Druzhilov S.A.
The Siberian state industrial university, Novokuznetsk, Russia

There is carrying out the analysis of contents of notions, which are used for description of the process and result of becoming and development of individual professionalism. Professional becoming is connected with the development of personality of human-personality. The development of personality isn't stop while the mastering of profession by human and while him becoming a specialist. The progressive development of personality is connected with the solving of inside antagonisms and is accompanied by its conversion to more high degree of self-consciousness, which is peculiar to professional. It is possible only while human has the presence of necessary *individual resource of professional development* (IRPD). At the composition of IRPD there are included not only behaviors that guarantees the triad "knowledge-skills-abilities", but also vital valuable that defines inside "picture of World" of human-professional.

Keywords: professionalism, professional becoming, development of the person, individual resource of professional development (IRPD).

Professionalism is considered by us as the behavior of people to carry out complicated (professional) activity with high effectiveness and quality while different conditions [4]. Carrying out of activity at unfavourable conditions requires involvement of human's existed potential possibilities – resources and reserves, which are directed to the compensation of unfavourable factors of environment, and also to the getting of positive result. Professionalism reveals not only at achievement of human high production indicators, but also at the peculiarities of his motivation, sence of labour, system of aspirations, value orientations, relations with the World.

Professional becoming can be represented at the view of two base lines: a) as the development of *activity* – of its structure, totality of ways and means, order of movement of which has target determination; b) as the process of development of *human* as a professional. At the article there is an accent to the theoretical analysis of becoming *professional* by *human*-personality. Human is a biological individual, personality, subject (of labour and life in common) and individuality. While the professional becoming there are brought into play *all* its levels, but degree of their "participation" changes depending on concrete phases. Professionalization is accompanied by the changing of human in common – of his individual, personality, subjective qualities, formation of individuality. The most meaningful here are highest levels of human – personality and subject.

The term "formation" is opened as category that expresses the changeability of things and phenomena – their continuous transition into something other, as the notion, which characterizes *transition* condition. While the psychological study of professionalism of human at the category "becoming" we would single out *procedural* and *resultant* aspects, which are dialectically connected. Procedural aspect is characterized by dynamism, constant incompleteness. Becoming (as the result) is considered as something already *appeared*, but still very far from completion. Let's make it clear: something that appeared at the *base* of something and it's *developing*. While the consideration of any line of professional becoming (development of *activity* or *human*) there is suggested that for such development there is a *base* – reached earlier levels of activity, or existent behavior of human. From this there is follow that becoming of *professionalism* is possible only at the base of human's existing *inside resources*.

At psychological literature the professional becoming is considered as integral phenomenon, which includes not only *objec-*

tive (prestigiousness of profession, its social competitiveness and other *social* conditions) factors, but also *subjective* factors (attitude of human to the profession, to himself as to the professional, professional ideals etc). At the conception of *professional becoming* (T.V.Kudryavcev, A.V.Suharev) the result of professionalization is considered as finding by human of professional and social maturity. *Procedural* aspect is expressed at the comprehension of professional becoming as integrate continuous process, which is the part of life trip of human. Let's accent that *continuity* of this process doesn't mean its monotony what was repeatedly noted by researchers (heterogeneity of professional way – E.A.Klimov, V.D.Shadrikov and others; "intermittent" phases – at the transformational theory of professional studying – V.F.Venda).

We consider professional becoming as the *process* and *result* of interiorization by human of psychological models *profession* and *professional activity.* Psychological model of profession includes following submodels: a) model of *professional environment*; b) the conceptual model of professional *activity*; c) the model of specialist as of *subject of activity* (totality of images, which reflect the system of behavior and attitudes of human as member of professional community) [2]. The becoming of professionalism of human we connect with *development* of personality at the base of his existed individual resources.

Development (at the scientific meaning) is a process of motion from the lowest (easy) to the highest (complicated), which realizes inside tendencies and essence of phenomena that leads to the appearance of new. At philosophy the development is considered as irreversible, directed, logical change of matter and consciousness; at the result of development there arises new condition of system – its composition or structure. There are singled out two lines of development: ascending (progress) and descending (regress). At first case there occur expansion and arising of system's possibilities, complication of its inside and outward connections; at second case – decrease of such possibilities, which is accompanied by comparative simplification of system's structure, by increase of irregularity at connections between its elements. The development is guaranteed to each element of any system and to systems of any kind. Changes occur spontaneously, because while the definite condition of system (appearance of inside and outside oppositions) they have no way not to happen. Development is not only quantitative changes, but also quality transformations. Therefore regress (to which belong not only professional deformations, but also destructive carrying out of activity) cannot be considered simplified as the process of return to the previous phases of development.

Changes of human occur inevitably, logical, involuntarily at that moment, when at the system "human – profession – World" there form *antagonisms* between requirements of professional activity and professional society, on the one hand, and possibilities, abilities, style of activity and communication, experience of human – on the other hand. While the considered like this *professional development* changes of human-personality are not planned by him "events in life", and they not depend on his will.

Professional development are inseparably connected with *personality one.* We share U.P.Povarenkov's viewpoint, according to which *professional development* is continuation of *whole* development of human, but at the frames of new specific *situation of development* [5]. And this situation, in our opinion, is set not only by contents and conditions of professional activity, but also by profession in whole as a social institute.

It's common knowledge that individual characteristics of human (installations, degree of pretension, peculiarities of intellect etcю) can not only promote becoming of professional mastering and creative approach to the labour activity, but also impede it. We consider that only those characteristics that promote forming of his professional mastering and are accompanied by *progressive* changes in his personality can be put into the

earlier singled out by us *individual resource of professional development* (IRPD) [1]. The presence of necessary IRPD promotes human's professionalization. The shortage of IRPD not only complicates professional becoming of human but also leads to the professional deformations, destructive carrying out of activity and to the premature professional aging [3].

Progressive should be considered such development of personality, while which happens progressive removal of miscoordinations between its separate behavior (and levels), and "generalization" of the system of *relations* of this personality (using of word of V.S.Merlin in respect to "integral individuality"). It's hard to agree with wide opinion, which connects (or indentifies) professional development of personality with professional self-determination. Self-determination is the act of assertion of one's own position at the problem situation. The process of self-determination, realization of oneself at the activity occurs while any professional way. But the achievement by human of professional self-determination it's not surely the result of progressive development that leads a personality to the opening of its possibilities, to complication of its connections with the World.

Professional becoming, at the result of which personality becomes the *subject of labour*, characterizes the *progressive* line of professional development. This is the level on which human has mastered the professional activity and has become *specialist* at his professional sphere. But professional development of personality doesn't stop while this. We defend the position, according to which for the progress by human the top of professionalism is not enough the appearance of subjectivity at professional activity. The necessary (and fundamental) condition of progressive development, reaching of professionalism, is conversion of personality to the higher level of *self-consciousness*.

The problem of self-consciousness, by S.L. Rubinshtein is the problem of definition of one's own *way of life*. S.L.Rubinshtein (1940) singled out two ways of human's existing in this world. First of them – is life, which doesn't go out the spontaneous connections, in which human lives. In that case at the system of relations of human there dominant his attitude to certain phenomena of reality, but not to the life in common. Second way help human out of the frames of particular; it's connected with the recognition of *value-sense* categories. L.M.Mitina orienting at these types of human's existing describes two *models of development*: a) model of professional functioning – *adaptation*; b) model of professional *development* – creativity and *personality growth* [6]. We consider that these models can be considered at the dynamic as the *phases* (levels) of professional development.

Professional functioning as *adaptation* is determined with oppositions, which occur at the system of "requirements of profession – possibilities and needs of human". Adaptation is considered widely: this is not only *accommodation* of human-personality, but also accommodation (transformation) of professional environment that means it's changing according to the requirements of human-personality. In that case human acts like a subject of labour, emergent to the level of *specialist*. Examined level of professional functioning doesn't require withdrawal from the "frames of peculiar". The dynamics of professional life by this model is adaptation, becoming and stagnation.

Professional self-development of personality (according to *second* model of development) is determined by oppositions between "Me-working", "Me-reflected" and "Me-creative". While the behavior of *professional self-development,* human is characterized by the ability to go out the frames of the current of peculiar. This allows to accept inside, to realize and value hardships and oppositions of different sides of professional activity, independently and constructively solve them according to one's *value orientations*. We consider that this model of professional self-development is oriented to the active use of human's existed *individual resource* (IRPD). The ascent of human by singled out

by L.M.Mitina stages of this model (self-determination, self-expression, self-realization) characterizes the *progressive* line of professional development of personality. The result of such development is becoming of human-personality as the subject of life, and his behavior at profession and professional activity not only become part of his life, but also are defined by the system of his vital values, inside "picture of the World".

If profession stops to put human into the situations that require solving of oppositions then he should find the senses for his further *self-development* as the professional by himself. The source of self-development is IRPD; it defines the vector of personality's development or the realization of its *potentials*. Professionalism doesn't except humanity, and self-development appear itself the way of reaching and comprehension of *humanity* by specialist.

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PSYCHOLOGICALLY-PEDAGOGICAL CONDITIONS OF FORMING THE PERSONALITY PREPARATION TO THE CREATIVE INTERACTION OF TEACHER AND STUDENTS AT MODERN EDUCATIONAL PROCESS

Yakovlev B.P., Povzun V.D.
State Educational Institution of Higher professional Training "Surgut state university of Khanty-Mansiinsk autonomus district – Yugra", city of Surgut, Russia

In the article there are represented the peculiarities of forming the personal readiness to creative interaction of teacher and pupils in modern educational process at the base of personal-oriented approach. There is observed the methodological contents of personal-oriented approach, peculiarities of personality readiness, basic psychologically-pedagogical conditions of forming of personal readiness at the system of education of students. Personality readiness to the creative interaction, the specific type of readiness, which doesn't suppose some special activity, but is a base level for readiness to any type of activity, particularly to the professional activity of teacher, to different specific types of this activity (cognitive, scientifically-research). The analysis of theoretic and methodical literature allowed us to single out the psychologically-pedagogical conditions of forming of personality readiness to the creative interaction of students and pedagogues. Their creative interaction and supplementing of each other will promote the effective self-realization of professional actions and personality manifestations of students at lessons. This will be expressed in that, while the organization of whole complex of conditions the educational process will be carried out more qualitative and effectiveness.
Keywords: modern educational process, personality preparation, teacher, student.

In conditions of increasing requirements to the quality of general education school should guarantee not only the digestion by students of defined sum of knowledge, but also development of personality of student. For this, in the opinion of V.V.Serikov [4], it's necessary to ensure intellectual development and personal growth, developing the abilities to the strategic activity, creativity, criticality, meaning of creativity, the system of needs and motives, ability to self-determination, self-development, positive conception I etc.

Nowadays there is more spreading the conviction that narrowly tactical "subject-oriented or technological approach" in education should give way to more wide and strategic "personal-oriented or humanistic approach". Modern school needs humanization of educational process. From then, the reasonability of use in the practice of education and upbringing of students of personality-oriented approach, by which one understand self-development of personality of child while creative participation, interaction with teacher.

Today teacher decides himself what program to follow, what educational methodical complex to chose. The choice of organized forms and methods of education is also given to the teacher. Therefore, there becomes more actual the necessity in teacher, who, orienting in the wide educational space and different theoretical directions, technologies, could not only take a part at innovative process, but also independently project his pedagogical activity, effectively using achievements of such sciences as psychology and pedagogy.

Personality-oriented approach in modern educational process predetermines double position of teacher – to be simultaneously teacher of school subject and psychologist [3]. From the moment teacher could make an educational process psychological, open origin cognitive possibilities of each student and in correspondence with it build for him individual educational trajectory of self-development, the effectiveness

of educational activity will rise, it will diversify the educational process, make it more interesting, comfortable, and in the final analysis will promote the quality of education and satisfaction of teacher by his own labour [1, 2].

In this connection the big meaning is gain by personal readiness of pedagogue for creative interaction with students, which is realized in his professionalism and is expressed in creative search of new, more effective ways of solving of pedagogical problems, in ability to adapt to the new types "subject-subject relations", in aspiration for self-realization and self-improvement at the process of his professional career.

Carried out analysis of researches allows to make a conclusion that the problem of forming of personal readiness to creative interaction is rather actual and is examined in different directions, and each new round in the development of modern education requires the new trying to understand of this problem and of new approaches of its solving.

Accordingly to personal-oriented approach, so that student be a full subject of educational-cognitive activity, it may be important to realize defined psychologically-pedagogical conditions at the process of his creative interaction with teacher. While these conditions, through the system "subject-subject relations" there is formed active-personal readiness to the self-development [5].

By the personal readiness to the creative interaction of teacher and students we understand psychologically-pedagogical direction, mood for constructive activity, mobilization of abilities to the combined active and reasonable skills, which condition the quality of education and effectiveness of educational activity.

Essential meaning while this will has the readiness of scientific paradigm about what place will occupy the personal readiness for creative interaction at the educational process, professional activity.

The most important psychologically-pedagogical conditions that testify to the formation of personal readiness to creative interaction will be:

1. *Readiness of pedagogue for the realization of personal-oriented approach.* Personal readiness of pedagogue requires the actualization of development of his psychological abilities (communicative, organizing, gnostic, constructive, reflexive):

– during the communication with pupils to accent the attention at the subject of activity or relations;

– to instrument the recognition of pupil and pedagogue to the difference in opinions, judgments, tastes, abilities – then communication with children becomes interesting, spiritually rich;

– not to resort to direct and open assessment of pupil, while the estimation to use the trick "me-message", then there is strengthened the confidence of student, there is risen his activity and self-appraisal;

– the appearance of empathic understanding of students, respect, benevolence, expression of sympathy for his vital functions, to empathize his successes and failures;

– to accentuate the uniqueness of his personality's "I" – then there is risen the status and self-control of this pupil in the group.

2. *The transfer of student from the position of object of upbringing and education to the subject of self-development.*

This condition will be realized if:

– there is guaranteed the subject-subject interaction of all participants of educational process.

– the creation at the lessons the situation of success at the educational activity, which creates the conditions for guaranteeing to the student the positive experience of growing before the group and pedagogue, what stimulates further self-cultivation of personality and is a source of self-development, self-education;

– interpersonal relations, which suppose the creation at the lessons the mutual understanding, benevolence and openness. Pedagogue should become true advisor-facilitator, who has an authority and respect among the students.

3. The creation of *situations of personality self-development and mutual "creative enrichment" ingenuously at educational lessons.* This condition provides for:

– the contact between the pedagogue and students through the dialogue, which supposes the equality of psychological positions of two interacting sides. The situation of two-side interaction means the active role of all enabled sides. Dialogic interaction supposes:

– reorientation of space of education to the personality sphere of students;

– "playing and creative" form for the creation of situations of personality development with active use of methods of mutual education, mutual control, change of role positions;

– the use of means and methods for forming of motivation of studying. Educational process is directed to the forming of positive motivation, in its replenishment by the mean of activity of personality itself;

– the use of problem methods of education in the digesting of results of scientific cognition, system of knowledge, process of getting of results, forming of cognitive independence and development of creative abilities of student.

4. One of the conditions of realization of personal-oriented education at school can become *the organization of psychological preparation of students and pedagogues*.

As principle directions of preparation for activity of teachers and students in school should be examined and realized the methods of psychological support, psychoprophylaxis, psychodiagnosis, psychocorrection, psychological consultation, psychological enlightenment and other methods. Positive meaning has the generalizing of experience of psychological, professional consulting, for example, through the dialog; carrying out of subject-reflexive trainings; giving of individual consultative help to pupil. The fact is the prevail at the school group forms of lessons, including group games, group trainings etc, are more suitable for the training of thinking but not for the development of secret sides of personality. Therefore personal contact of student with high-qualified specialist psychologist-pedagogue can be irreplaceable mean of individual support of pupil, if he has a necessity in this support and has realized that.

5. The important condition of forming of personal readiness is *control and self-control*, which plays a role of opposite connection in the development of personality. The effective diagnosis of personality should be based at the information about revealing of personality not in some one, comparatively narrow type of educationally-subject activity, but in the vital functions, that means to have system-style character. Nowadays the technology of psychologically-pedagogical control as the system of psychological support begins to work in modern school. The base problem consists in scientifically-research skill of teacher to professionally use received facts for educationally-upbringing process.

Proceeding from information stated by us on can say, that the interest to the research of psychologically-pedagogical conditions of forming the personal readiness to the creative interaction in conditions of modern educational process testifies to the actuality of this range of problems. And with it there are still not enough examined the specific components of personal readiness to creative interaction of teacher and pupils to the combined in conditions of educational activity. There have need of renewing the methods of selective formation of psychological readiness of future teachers of a school subjects to the creative interaction even during HEI's preparation.

Nowadays there is no less important the problem of diagnostic, development of criterions, means and methods of condition of personal readiness to creative interaction, what is necessary for the creation of theory, and for practical aims – the control and direction of readinessm prediction, projecting, assessment in the decision of creative tasks, situations of subject-subject interaction, special psychological preparation, guaranteeing

the effectiveness and success of educational activity and psychical health.

This whole complex of problems requires further efforts for its solving.

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SPEECH PATHOLOGY AS INDICATOR OF BIOLOGICALLY DEFECTIVE GROUND OF CHILD'S INDIVIDUAL-PSYCHOLOGICAL FEATURES FORMATION

Cherepkova N.V.

The concept of mental as process (S.L. Rubinshtejn) is a methodological basis of understanding and research of mentality's succession and continuity (continuality) as a whole and it's any traditionally selected component (I.M.Sechenov, S.L.Rubinshtejn, A.N.Leontiev, A.V.Brushlinsky).

Being mediated system of language signs which named (by L.S.Vygotsky) – mental implements, speech reconstructs all mental processes of person, reached conscious functioning level. Connected with consciousness as a whole, speech of person is incorporated into certain mutual relation with all mental processes.

Any mental function which represents difficult conscious form of mental activity has certain structural and dynamic characteristics.

All mental processes of child – perception, memory, attention, imagination, thinking, and purposeful behaviour – are formed and develop with direct participation of speech (L.S.Vygotsky, A.R.Lurija, S.L.Rubinshtejn, A.N.Leontiev).

As L.S.Vygotsky's, A.N.Leontiev's, A.R.Lurija's and other scientists works have shown, human forms of behaviour, speech, mental functions and abilities are not given to child from birth. They are formed under decisive influence of purposeful perception and training, his life in society conditions.

Studying human consciousness and emphasizing its connection with activity, in which it's not just appears, but also formed, it is impossible to digress from that person – is a social creature, his activity is social and consciousness is social too. The consciousness of person is formed during communication between people by speech means (L.S.Rubinshtejn).

N.I.Zhinkin (1966) interpreted speech as one of activity kinds, incorporated in person's general activity system.

L.S.Vygotsky (1995) wrote: "All higher mental functions – logic memory, voluntary attention, thinking, speech – have common mental basis…" "…Central role in higher mental functions construction as researches displays, plays speech and speech thinking, undoubtedly those specific human functions which should be, seemingly, indoubtedly labeled as products of human historical development".

Connected with consciousness as a whole, speech of person is incorporated with certain mutual relation between all mental processes; but the basic and determining for speech is its connection with thinking. A priori, i.e. without special proofs, it is obvious that language and thinking are connected with each other. However correlation of thinking and speech – is a difficult enough problem. Its offered solutions were different – from admission of independence and full division of thinking and speech to so unequivocal their identification. Now prevails the compromise point of view according to which thinking and speech are closely interconnected although in genesis and functioning they are independent realities.

Specific features of children's with speech pathology intellectual development are caused by mechanism and structure of speech defect.

According to number of authors (R.I.Martynova, 1973 etc.) in preschool age children with dyslalia are observed to have hypererethism or, on the contrary, sluggishness; frequently they have insignificant general development retardation. Children with defects of articulation are less active in collective, ashamed of speech defect. Their speech frequently causes sneers of the same age children and critical remarks of adults – all this depresses them even more and results secondary changes in character. Irritability, tearfulness, sensitivity of such children can be early developed. They cannot cope with bad speech independently and, suffering from that, react by aggressive behaviour.

Patients with rhinolalia (cleft palate, cleft lip) are observed to have features of emotional experiences associated with position of such children in collective or preschool institution. All this easily smooths out in family by reasonable enough and love treatment of surrounding people. Among patients after surgery of cleft palate there are people which have graduated high schools with honours, entered the postgraduate studies, capable workers of different specialities.

At motor alalia, aphasia, dysarthria – speech defects which have arisen because of central nervous system organic lesion, – disorders of any thinking processes are more expressed, than at stuttering of organic genesis. Specified heavy speech defects change children's ways of communication, socially – psychological adaptation, break means and ways of intercourse, reducing intellectual development general level. Children with expressed speech disorders are frequently observed to have mental retardation which characterized by delayed rate of reception and quality of information processing, that also worsens adaptable and communication abilities of child. This group of children have undeveloped skill of purposeful

conditions analyzing of cogitative task, or situation in which they are in real life, in its essential elements, its important elements sorting out, generalization, abstraction, control realization and adequately estimation of activity results. There are arise practical difficulties in planning and adequate choice of problems solution, and also during consecutive realization of those operations which child will seize, particularly in "step-by-step" own activity control realization. These difficulties are combined with stability and disorder of attention switching that results not only numerous mistakes, but also pseudoneurotic symptomatology as irritability, inactivity, emotional lability etc.

Our observations and experimental – psychological researches have shown, that moderately expressed constitutional-typological insufficiency of higher nervous activity and personality, cooperating with adverse external factors (social, ecological), promotes negative drift of psycho-typological features from range of norm aside limit of borderline abnormal personality range of organic nature.

Representatives of borderline abnormal personality display a low level of compensatory brain abilities. Quickly formed pathological speech functional system depresses protective mechanisms and adaptable forms of nervous system reorganization that promotes development of pathological process and further disintegration of central nervous system activity as a whole. It is shown in chronification of speech frustration and all nervous system as a whole and, as a consequence, appears emotional experience of defect, psychological problems of personality character.

Therefore, constitutional conditionality of organic insufficiency of brain allows to define a belonging to concrete psychic type, concerning to concrete range of psycho-typological continuum. Constitutional-typological insufficiency of higher nervous activity and personality results (under influence of adverse factors) fast intensification and stabilization of abnormal personality variability of children with speech pathology, from character accentuations to range of borderline abnormal personality up to psychopathy. Thus speech is one of the basic parameters of constitutional – continuous personality variability.

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RK INNOVATION STRATEGY

Sakhanova G.

Under present-day conditions, innovation is a factor that essentially influences on the national competitive strength development.
A major focus of interest of scientists is paid on the issues to develop science, innovation and structural transformations in industry, ensure systematic interrelation of these processes based on measures, state policy and economic adjustment mechanism.
Keywords: innovation, strategy, technology.

Kazakhstan became the first country in CIS, which established a regulatory-legal framework to develop industrial parks networks. Starting point for industrial parks development is approval of the "Strategy of industrial-innovative development of the Republic of Kazakhstan within 2003-2015" by the Decree of the President N. Nazarbaev. Industrial parks in Kazakhstan are created to the benefit of domestic sales market and have clear topical, branch and regional orientation. Industrial parks must solve issues on creation of informational technologies meeting international standards, and shall contribute to fullest utilization of scientific and intellectual potential of the country. Virtually all the industrial parks around the world are established under standard scheme adopted all over the globe, under higher educational institutions. However, the scheme poorly takes into account the peculiarities of native innovative activities, as the basic mass of scientific and technical work was performed rather at the branch institutes than at the universities. The present specific character must be considered fully when creating social and organizational forms of science and production integration.

Innovative development of Kazakhstan

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A major focus of interest of scientists is paid on the issues to develop science, innovation and structural transformations in industry, ensure systematic interrelation of these processes based on measures, state policy and economic adjustment mechanism.

Japan changed its strategy from the beginning of 70th, by commencing developing own R&D (research and development) intensively, focusing on acceleration in the rates and minimization of expenses on updating of products, modernization of technologies at all stages of products manufacture.

A number of countries' experience (Singapore, South Korea, Finland, China, Israel, India etc.) testifies that accelerated transition to innovative model not only possible, but can be very successful. For example in China there is a program for R&D support and development, which has been functioning since 1991 and provides for concentration of efforts on the set of knowledge-intensive industries (microeconomics and computer science, fiber-optic communication, genetic engineering and biotechnology etc.) and creation of new technologies development zones in industrial parks.

As to the aggregate index of innovations, Finland and Sweden became the leaders. Achievements of these two countries are above average for EC almost by all six groups of particular innovation indicators used to calculate total innovative index (overall, 25 private parameters are applied in the European innovation monitoring system «Trend Chart»). Sweden has been holding the first place since 2003. Sweden and Finland are behind EC only by two criteria: university R&D financing on a part of private companies, besides, Finland is behind by innovative activity of small enterprises, and as for

Sweden–by dynamics of science intensive export.

Awareness of scientific-technological progress meaning in ensuring of economic growth by the political leadership of these two countries enhanced this factor in economic policy, which sequentially expressed in transition from scientific and technical to technological and then to innovative policy.

If the government does not make active stimulating effect on the process, development of innovative technology is inconceivable. Ruling circles of all developed countries realized it fully. More than 2% of GDP (gross domestic product) is spent on R&D in all western countries, and in countries advanced in this field best of all (USA, Germany, France, Great Britain, Switzerland, Japan) the percentage reaches around 4%. Expenses of largest concerns (TNC (transnational corporations)) on R&D, especially in electrotechnical and electronic, chemical and automobile industry, as a rule reach 8-12% of their turnover and 15-20% of their aggregate costs (expenses).

Innovation process needs investments at an early state when only idea itself and experiments are financed. If in developed countries this function is assumed by private enterprises that participate in R&D and introduce innovation into production, then in developing countries an entrepreneurial activity is not so high. Therefore, a state support is specially needed at the initial state to create small innovative infrastructures (research centers, industrial parks, incubators).

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Kazakhstan enters entirely new stage of its development and there is a great challenge – to create new Kazakhstan in new world. We need to create a model of economy that worldwide leaders are approaching to. The experience of developed countries shows that 70 to 85% of GDP growth falls on new and advanced technology. For this reason, there is an issue of our country's transition to the "knowledge-based economy" on the agenda. "It is the only means for Kazakhstan to be far from "gallery", not to get stuck in back rows. We have all the things needed to be bracketed with leading states, achieve high living standards for our people" [1].

High technologies are the powerful instrument thanks to which many countries not only overcome economic recession, but also achieve a competitive strength of the country by filling the market with various upgraded innovative products. That is why manufactures are focusing their main effort rather on proposing new goods to a consumer than seizure of old goods markets and exclusion of competitors out of them. Novelty of goods serves as a determinant factor of struggling for domestic and foreign market. Both new and upgraded, improved variants act as new goods at the market.

A basic engine for industrial-innovative development must become a private sector, a government shall act as an accelerator and initiator in issues concerning economy competitive recovery and contribution to creation

and modernization of small and medium enterprises by involving them into innovation processes.

There is preserved an imbalance between scientific-research and engineering development in Kazakhstan. A portion of the Research Institute among the research structures reach approximately 45% in our country, and only 6.4% fall on design and engineering organizations. As to the quantity of specialists, there are 4 designers and 25 scientists per one pilot-production employee. Everything is vice versa in foreign countries. There are 2 designers and 4 pilot-production employees per one scientist. A portion of financing (up to 70%) is spent on the applied research in our country and only 8% fall on research and development work.

For a while, we have few innovations, we are developing few new finished products.

In the eye of National Innovation Fund a financial support of Development Institutes, transfer of world modern technologies and products of the given branch shall serve as another impulse for further development of food industry. In this respect, a food industry has been defined as one of the priority directions for the Fund's financing [2].

To increase technologic competitive strength of the native production the Innovation Fund makes investments into new and existing companies at the initial stage of innovation commercialization (start financing stage) and into companies that need additional investments to expand volumes of innovative products (works, services) and get to the international markets (stage of initial and/or quick expansion).

Principal conditions for investment are:

• investment project meets the priorities of industrial and innovative policy of the Republic of Kazakhstan;

• a project is focused on creation of a new type of science intensive products (works, serves), or on increasing of engineering level, introduction of new and improvement of used technologies;

• a project is commercially attractive (particularly an innovation has a potential to grow market niche);

• strategic investor existence.

In addition, the Fund provides grants for research and development work (RDW), focused to perform research and development, experimental work, ensuring transfer of applied research scientific work (RSW) results into production and focused at receipt of product (pilot sample) with feature of novelty, inventiveness, originality and commercial application [3].

To improve a public administration system in the sphere of industrial and innovation development and create favorable conditions to ensure economic growth of the state there was established a "Fund of sustainable development "Kazyna" by the Decree of the Republic of Kazakhstan President.

Rather knowledge, intellect, information, innovation that currently is turning into real factors and standalone products of manufacture and services is becoming the most important assets being formed in the world of high technology, informative-network economy than the materials resources that we used to see in former times.

The National Innovation Fund is established to increase general innovative activity in the country and to contribute to development of high technology and science absorbing industry.

The mission is being implemented through creation of venture funds, industrial parks and business – incubators, financing of innovative projects and providing of grants for RDW.

As well, the Fund is investing high-technology start-up companies abroad and organizing measures raising innovative activity in Kazakhstan.

As early as in 2003 there was declared a guideline to transfer from raw stuff-based economy direction to innovation economy with adoption a strategy of industrial-innovative development for the period until 2015. Such directions as scientific potential development, formation of financial instruments

cluster in terms of venture capital, establishment of innovative activities entities in form of industrial parks and business incubators as well as development of innovation entrepreneurship have been determined as four basic elements.

If we talk of the priority investment sectors, then currently up to 60% of Fund total funds is invested into such directions as information technology, technology for food industry, oil and gas sector, biotechnology and pharmaceutics as well as alternative power energy. In this connection, their being in demand at the market and commercial return act as projects selection criteria and such kind of approach has already brought a tangible financial result. So, in 2007 the NIF withdrew from the project focused on manufacture of innovative log recorders "Geoscan", which was implemented by it together with "Well log survey" Company" JSC (WLS) in Aktyube oblast. In spring of last year, the Weatherford International Company purchased 75% portion of WLS (including 25% of shares owned by NIF) due to which the state cleared a profit amounting to 96.4 million tenge [4].

Thus, innovation process is a powerful instrument thanks to which we are to overcome economic recession, ensure its structural reorganization and fill the market with various competitive products with high value added. Innovation process is appealed to ensure increasing of country's gross domestic product due to launching the production of brand new types of products and technologies and development of domestic goods sales market based on the same.

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THE LOADING – TRANSPORT COMPLEXES FOR THE UPLAND OPEN CUTS OPTIMAL AND EFFICIENT TYPES CHOICE

Volkov E.C., Plyutov Yu.A.
The Siberian Federal University

At present, the road transport in complex with the excavators or the bucket loaders are being used mainly on the world's upland open cuts. Its exploitation is being characterized by the high level energy content (e.g. by the large fuel consumption), by the cargo transportation considerable prime cost, by the difficult routes, and by the environmental pollution. The aerial cable – aerostat transport systems, which will be able to be provided the complete energy autonomy of the work by the shortest way over the surface, are suggested to be used by us, as the alternative. For all this, the high work standards and the good performance by the energy efficiency and the transport works ecology will be achieved.

The existing and the suggested upland open cuts' transport systems comparison is being carried out by the efficiency measures and the performance criteria, which are being defined during the mathematical – economically modeling on the PC. The cargo transportation prime cost, the energy specific consumption, the efficiency, the reliability indices and also the ecological qualities and characteristics are being related to all these criteria. The already developed mathematical – economically model is being provided, as the optimal (e.g. by one efficiency criterion), well as the rational (e.g. by efficiency measures and the performance criteria aggregate) versions. So, the preliminary calculations and the pre-designs have been shown, that the aerial cable – aerostat transport plants, in comparison with the motor transport have, in general, less its prime cost and the energy specific consumption, but and they have less efficiency, and also the low level technical availability for the service coefficient. The loading – transport complex with the aerial cable – aerostat gravitational plant (e.g. the cargo transportation distance has been varied from 1,5 up to 8 km in the different transport schemes) is the efficient one for the upland open cuts, having had the annual production rate from 0,2 up to 2,5 mln. tons and the transported cargoes apparent density from 1,5 up to 2,5 t/m^3. The upland open cuts' efficient transport scheme choice methods are being developed on the basis of the received and the final results.

The work was submitted to the scientific all-Russian conference «The Science and Education Contemporary Challenges», Moscow, 16-18 February, 2010. Came to the editorial office 14.12.2009.

THE NEW WAY OF DIRECION OF THE COMPLETES OF REVERSIBLE GATED TRANSFORMER

Magazinnik L.T.
Ulianovsk state technical university
Ulianovsk, Russia

Nowadays the way of combined direction of gated completes of m-phase reversible transformers at the IGBT, MOSFET transistors and thyristors with an artificial commutation is widely used at the transforming technics. The realization of idea of combined conformed direction is possible without revealing of not only average, but also momentary components of tension and current at the equalizing circuit, which includes the necessity at the equalizing reactors both in statistic and dynamic modes of working of transformer. But it should be recognized that this result is observed only in condition of momentary commutation of phase currents. At the real schemes of transformers of such type owing to final duration of commutations at the equalizing circuits there can develop commutative equalizing currents, the limitation of which requires saving at the mentioned circuits the current-limiting reactors, but with rather less inductance. Therefore, the carrying out of these transformers at the general case can be carried out not only by counter-parallel, but also by other known schemes of connection of gated completes, which are used while the combined direction for decrease of quantity of mentioned reactors.

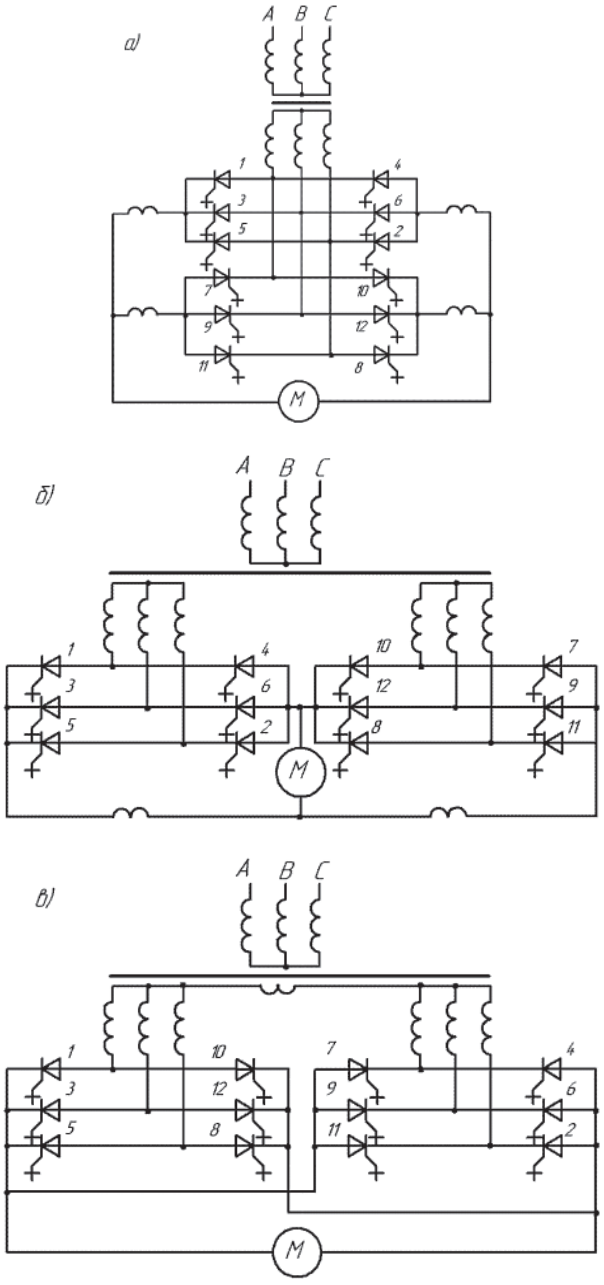
And with it at the transformers of this type for improvement of dynamic and energetic indicators more often use there are ways of regulation at the base of high-frequency methods of modulation with repeated switching of each valve at the period of network tension begun to receive. While this, the carrying out of two-completed transformer is possible not only by counter-parallel, but also by cross and as it's called N-scheme of straightening [1]. Therefore it's reasonable to spread the idea of combined direction of gated completes without equalizing currents at the rest of known variants of carrying out of two-completed reversible transformers at two-operating valves independently from the force scheme and accepted law of modulation.

For it at the general case there is supposed simultaneous giving of unlocking impulses to next

valves of both of completes, switching of which leads to the connection of the circuit of load with the same phases of circuit or repeated winding of strengthening conforming transformer in the sequence, which is depend on accepted ways of modulation while the regulation and number of switching the valve at the period of line voltage.

The realization of this way is possible only in three variants, subject to the connection of valve completes at the strength scheme of reversible transformer (picture).

The first variant is intended for the use at the transformers, which were carried out at the base of counter-parallel connection of two valve completes, one of which has depending on accepted scheme of straightening one or several cathodic or anodic valve groups, which let go pass the current of load at the positive direction, and other complete has equal number of antiphased to the mentioned valve groups, which let go pass the current of load at the negative direction. The way is differ by its simultaneous independent from the direction of the current load giving of unlock impulses to the next valves of first complete and antiphased to the mentioned valves of second complete, which are connected to the same phases of net of second winding of two-winding conforming transformer.



The second variant is intended for the use at the reversible transformers, which were carried out by the cross scheme of connecting of two valve completes, every of which consist in valve groups, which let go pass the current of load at one direction with the use of three-winding matching transformer, which contains two repeated windings, voltage in which depending on direction of winding can be at the phase of at the antiphase to each other. This way is differ by simultaneous giving of unlock impulses to next valves in composition of valve groups of first complete, which are connected to the lead of one of the repeated winding, and also depending on the scheme of connection of repeated windings of transformer or to the antiphased to the mentioned valve groups of second complete, which are connected to the leads of other repeated winding of transformer, the voltages in which change in phase to the mentioned or at the of the same name of mentioned valve groups of second complete, which are connected to the leads of other repeated winding, voltages in which change in antiphase to the voltage of mentioned winding.

Third variant is invented for use in N-scheme, which contains three-winding transformer with combined with the help of reactor average points of two similar repeated windings and two valve completes, the half of valve group of each of which is connected to the leads of one, and other half to the lead of other of mentioned windings. This way is differ by simultaneous giving of unlock impulses to the next valves in the composition of dissimilar valve groups of first complete, which are connected to the leads of different repeated windings, and also to the valves of second complete, which are in the composition of antiphase to the mentioned valve groups, which are connected into a parallel to the same repeated windings of transformers.

Therefore, offered way of direction in all mentioned variants of carrying out of strength scheme leads to the similar positive result – the full removal in conditions of momentary commutation of equalizing voltage and current in static and dynamical modes of work of transformer. This behavior allows to guarantee the combination of qualities of combined and separate direction, and more exactly to except from the composition of transformer the equalizing reactors while the saving of momentary readiness to the change of mode of work, which removes the possibility of appearance the interrupted current of load.

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OVERALL INDUSTRIAL EQUIPMENT EFFECTIVENESS

Matyukhin P.V., Markov V.O., Rabunets P.V.
Belgorod state technological university by V.G. Shukhov Belgorod, Russia

Overall Equipment Effectiveness (OEE) is one of the most important indices reflecting a degree of equipment maintenance effectiveness in industrial enterprises.

Most industrial enterprises despite of a character of their production have a problem of low effectiveness of equipment operation. The problem is characterized by occurrence of everyday losses resulting from downtime and unforeseen stoppages of equipment, speed decrease of product treatment and faulty units manufacture.

There is a technique of overall equipment effectiveness assessment which is considering the influence of the above mentioned losses and allowing to fully analyze equipment operation both at particular procedures and within a framework of the whole production cycle [1].

The overall equipment effectiveness is calculated by the following technique:

OEE= readiness × output × quality × 100%,

where: readiness – is a ratio of net production time of the item by an equipment to a total time of production cycle;

output – is a ratio of actual output to a scheduled production output;

quality – is a ratio of number of quality products to a total quantity of manufactured goods.

The analysis of overall equipment effectiveness assumes that factory personnel are involved in a permanent monitoring and registration of indices which reflect current equipment condition and production process. Overall equipment effectiveness is a balanced index which allows to optimize production process resulting in optimal output capacity of the equipment and high quality of the manufactured goods that is, to our opinion, of necessity to many industrial enterprises.

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THE EFFECTIVENESS OF EXPORT OF EDUCATIONAL SERVICES AT THE EDUCATIONAL INSTITUTIONS OF RUSSIAN FEDERATION

Kazarin B.V.

Kuban state medical university, (Russia, Krasnodar)

The analysis of almost twenty years' period of job of educational institution with 50-year-old traditions of job on training of foreign citizens during rather drama period of development of the Russian Federation - in transition from a planned economy to economy market is carried out. Pricing process at training of foreign pupils and its interrelation with process of formation of a contingent of foreign pupils in an educational institution of the higher vocational training is studied.

The received materials have allowed to estimate market behaviour of educational institution in the conditions of the competitive environment and to estimate efficiency of its activity on export of educational services and a role of this kind of job of high school in maintenance of its economic stability.

Keywords: higher school economy, market behaviour of educational institutions, cost of educational services, export of educational services, the academic mobility, monitoring of the prices, a professional training for foreign countries.

Nowadays the more and more currency is gain by the problem of widening the export of educational services of Russian higher school as a real contribution to the modernization component of economy.

With it, in the opinion of A.V.Rozhdestvenski, "…one of the global aims of internationalization of higher education provides for getting an income. At its frames the educational services are supposed at the fully paid base without concession of state subsidies. Foreign students give an opportunity of attraction of extra sources of financing, and thereby they stimulate universities to realize enterprise strategy at the international educational market [5]".

This work correspond itself further development of published earlier works [1, 2] about pricing at the HEI (at the example of Kuban state medical institute – academy – university), and concerns more long period of observing – from 1991 till 2009 year.

As one see from the table 1, the approaches to the pricing at the Kuban state medical university during the period from 1990 year and up to present changed specifically. The initial price of education of foreign citizens in our university there was found a price of 1000 of dollars in a year for one student.

An aspiration for increase of the contingent of contractual foreign students makes

Table 1

The base price of education of foreign students in Kuban state medical university (earlier institute – academy) and some peculiarities of enrolment

Number	Year of enrolment	Base price (of US dollars)	PECULIARITIES OF ENROLMENT
1	2	3	4
1	1990	1000	No
2	1991	1300	No
3	1992	1300	Dispersion of prices: 800 $ in a year /Rosintermed/; 945 $ in a year for the citizens of India, Pakistan; tenth "bonus" contract for mediators; specially favourable price 1090 $ for the company MBSU + firstly introduced discount for the cancellation of dormitory
4	1993	1500	Dispersion of prices: 1090 $ for the company MBSU; tenth "bonus" contract for all mediators; the number of special prices 1395-1360 $ for some mediators

The table 1 termination

Number	Year of enrolment	Base price (of US dollars)	PECULIARITIES OF ENROLMENT
5	1994	1600	Tenth "bonus" contract for all mediators
6	1995	1700	Tenth "bonus" contract for all mediators
7	1996	1700	Full denial of the discounts to the mediators
8	1997	1700	The same
9	1998	1965	The same + cancellation of discounts for the cancellation of dormitory, separation of living at the dormitory to the independent price, which is added to the price of education
10	1999	1800	The same + separation of living at the dormitory to the independent price
11	2000	1600	The same + separation of living at the dormitory to the independent price
12	2001	1600	Without changes, imposition of 10% of payment of services of mediators
13	2002	1600	Without changes, use of 10% of payment of services of mediators
14	2003	1600	Without changes, use of 10% of payment of services of mediators
15	2004	1715,54	Without changes, use of 10% of payment of services of mediators
16	2005	1808,31	Without changes, use of 10% of payment of services of mediators
17	2006	2088,02	Without changes, use of 10% of payment of services of mediators
18	2007	2473,94	Without changes, use of 10% of payment of services of mediators
19	2008	2736,81	Without changes, use of 10% of payment of services of mediators
20	2009	2312,42	The cancellation of settling with mediators, concession of a right to independently levy sums from the student
21	2010	3172,14	The cancellation of settling with mediators, concession of a right to independently levy sums from the student, liquidation of some discounts

the HEI to widen the network of mediatory structures, which work by the enrolment of foreign citizens for studying at the commercial base, simultaneously with it such discounts as the discount for the cancellation of dormitory and "bonus" contract (per se "barter" settling for the services of mediator in percents) become being permanent. Al this allowed in 1993 year to get under way of increase of price of education.

1993-1995 years side by side with unification of discounts for mediators and their decrease, are characterized by the increase of the price of education. Starting from 1996 year, the university fully renounces the discounts for mediatory structures. There become effective the principle: "the mediator is independently levies pay that is due to him, in the excess of the sum that is due to HEI, and the HEI doesn't meddle in the financial relations between the student and mediator" [3].

At the table 2 there are represented facts, which characterize annual resumes of enrolment of contract foreign students in 1990-2009 years.

The facts at the table 2 are represented in a form of relative quantities, and at the columns 2, 3 and 4 the results of enrolment in 1998 year are taken in the form of 100 percents, and a column 5 is calculated with regard to the contingent in corresponding to the school year.

As one see from the given facts, starting from 1990 and till 1992 year there is observed "explosive" increase of enrolment of contract foreign students, and to the 1993/94 school year there is due the maximal number of students, which were admitted to the first course of academy, in the 1994 year the enrolment decreases to the indicators of 1992 year and remains rather stable till 1996 year, when there begins the decrease of this quantity that strengthens to the 1998 and further years.

Table 2

Some resumes of enrolment of foreign student to the first course (1990-2009 years) at the base of contracts

School year	The number of students, which were admitted to the first course in % to the enrolment of 1998 year	Real price of one contract at the first course in % to the 1998 year	General sum that was received by the contracts of first course in % to the 1998 year	Specific weight of contract students among the first-year-students (in % to all number of first-year-students)
1	2	3	4	5
1990/1991	4,11	61,02	2,51	3,00
1991/1992	31,51	83,84	26,42	40,00
1992/1993	205,48	74,22	152,50	69,00
1993/1994	378,08	67,40	254,81	98,35
1994/1995	212,33	86,58	183,84	97,44
1995/1996	219,18	85,51	187,41	96,99
1996/1997	180,82	99,22	179,41	95,18
1997/1998	156,16	97,42	152,13	98,00
1998/1999	100,00	100,00	100,00	94,83
1999/2000	106,90	98,44	84,76	98,39
2000/2001	106,90	83,16	71,59	96,77
2001/2002	91,38	85,39	62,84	90,57
2002/2003	143,10	80,85	93,17	90,36
2003/2004	110,34	92,03	88,86	92,19
2004/2005	144,83	106,46	114,23	88,10
2005/2006	136,21	128,49	98,08	86,08
2006/2007	139,66	135,15	96,52	85,19
2007/2008	208,62	151,79	153,70	90,91
2008/2009	134,48	116,88	103,86	82,05

The real price (in contrast to base price is the actual price of contract after the extension of discounts) of one contract, which was concluded with foreign students that were admitted to the first course slowly, except the leap in the 1991 year, increases. During nine years it grew approximately in 1,6 times, reached in 1998 year some minimum, then decreased, and from the 2004 year continued to grow again.

Other character has the change of general sum that was received by HEI by the contracts, which were concluded with first-year-students. From 1990 till 1994 year this sum increases, reaching in the 1998 year the intermediate quantity between 1991 and 1992 years. In following period (1999-2004) the takings of means decreased, and only from the enrolment of 2004 there are observed the increase of this indicator.

The facts, which were given in the table 3, characterize the dynamic of changes of all contingent of contract foreign students of Kuban state medical academy and connected with this some economic indicators in 1990-2009 years. By its composition it's analogous to the table 3. At the columns 2, 3, and 4 there given the facts relatively to their quantity in 1998 year, which is taken the form of 100 percents. From the table 3 one see, that the contingent of contract foreign students of academy, starting from 1990 and till 1997 year increases, from the 1994 the rate of increase decreases, in 1998 year there is observed the decrease of number of contract foreign students, and this decrease continues in the period after default.

Table 3

The contingent of foreign students of contract education
in 1990-2009 years and some financial indicators

School year	The number of students, which are taught at the academy, in % to the general number of them in 1998 year	Actual price of one contract by academy in general in % to the 1998 year	The sum that was received by contracts by academy in general in % to the 1998 year.
1	2	3	4
1990/1991	0,46	70,13	0,32
1991/1992	3,98	96,97	3,85
1992/1993	36,54	85,64	31,3
1993/1994	73,85	77,15	56,98
1994/1995	72,78	93,2	67,83
1995/1996	88,53	91,23	80,76
1996/1997	111,93	94,66	105,95
1997/1998	118,96	93,97	111,78
1998/1999	100	100	100
1999/2000	88,30	100,05	88,34
2000/2001	83,33	90,68	75,53
2001/2002	70,51	96,87	68,27
2002/2003	64,26	91,11	58,52
2003/2004	61,38	92,28	52,80
2004/2005	62,98	102,46	57,07
2005/2006	62,50	140,32	87,66
2006/2007	61,54	142,81	87,84
2007/2008	63,46	158,53	100,55
2008/2009	62,82	135,12	84,84

Thereby, comparing the facts of tables 1, 2, and 3 one can conclude that the increase of the cost of education of contract foreign students in Kuban medical academy and the liquidation of discounts for mediatory structures leaded to the negative changes of indicators of enrolment of corresponding school year and all contingent of contract students in general. While this the decrease of indicators was found as slow and began to improve only in 2004-2007 years, but the liquidation of discounts for the mediators in 2008/2009 and following years leaded to the decrease of number of foreign students of HEI again.

The diagram 1 clearly illustrates the connection between the number of contract foreign students, which are annually admitted to the academy, and real cost of education for the corresponding year. There attracts out attention the opposite dependence between these quantities.

Represented in this work facts, which characterize the price policy of Kuban state medical university, show that sharp changes at the sphere of pricing, for the reason of which there was carried out an enrolment, can lead not only to decrease of the number of first-year-students, but also of the all contingent of foreign students. The essential part while this is acted by stability of contractual obligations between the HEI and mediatory structure, which does the recruiting of foreign students.

The questioning of students showed that many of them as the negative moment call instability of cost of the contract, which is noted not only as a change of the price of enrolment but also as introduced right of

the HEI to index the cost of education unilaterally. This is confirmed in the work of S.M.Smolski [4] from the rather successful Moscow energy institute, at which there is stated the situation of "special importance of saving the base price during the number of years, what promotes the improvement of marketing situation for the HEI".

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Materials of Conferences

THE WATER ECOSISTEMS IN THE KUBAN RIVER BASIN (MIDDLE AND LOWER FLOW)

Nikitina T.A.
Kuban Social-Economic Institute – KSEI
Belan E.V.
The Kuban Basin Water Government of Federal Agency for Water Resources – KBWG, Krasnodar, Russia

Climate and hydrologic conditions of the Kuban river basin often lead to floods, water loggings, landslides and river erosion.

The largest water loggings in the region affect not only agricultural lands, but also residential areas.

Water logging due to natural and anthropogenic factors leads to saturation of soil by water, and causes disastrous changes in its physical, mechanical, agrophysical and agrochemical properties, as well as in the vegetation.

The river beds and the coasts of the Black and the Azov seas are exposed to wave abrasion and degradation. Yearly, the sea washes away about 100-120 thousand tones of soil landscape; the total loss of the high-grade Kuban black earth is estimated at hundreds of hectares.

More than 20% of Kuban's annual flow is irretrievable water consumption, which causes insufficient water supply of spawning areas in the Kuban lagoons and worsens the hydrochemical conditions, already affected by considerable discharge of polluted waters from the rice fields.

Water conservation zones in the rural areas are often involved in the crop rotation with the use of herbicide and pesticide weed control, which suppresses the aquatic and semi-aquatic flora and fauna.

Analyzing the data on the catch of migratory and semi-migrating fish species in the last ten years, we can see that depletion of commercial fish stock has not ceased, moreover, a steady trend of further reduction is being observed (Yu.I.Zaidiner, L.V.Popova, 1997, 2002; L.T.Gorbacheva et al., 2006; T.A.Nikitina, O.I.Akselev, 2007).

The biogenesis of the Azov-Black Sea Basin is exposed to a number of negative factors:

– insufficient water supply of the natural spawning areas;

– the main rivers of the Azov-Black Sea Basin are overregulated;

– rivers and seas are contaminated with petrochemicals, heavy metals and other substances;

– occurrence of abnormal natural disasters (storms, hail, hurricanes, floods and etc).

The water ecosystems also largely affected by snowmelt and rain water, carrying harmful substances from the residential areas. Wastewater is discharged by dilution directly from the sewers into the surface water, causing its pollution. Water probes taken from the rivers below the cities of Maikop and Krasnodar, exceeded the maximum permissible concentrations of substances that have an obviously anthropogenic origin. Due to that fact, construction of sewage cleansing facilities is a vital problem for many big cities in the Kuban region.

Floods on rivers Belaya, Laba, Fars and Kurjips, which occur at any time of the year, have also a negative impact on the water ecosystems, as they constantly change the stream beds, lead to river bank collapse and new alluvial formations, which get overgrown with tree and shrubbery vegetation.

Longstanding hydrochemical studies on the water quality revealed a higher content of phenols, petrochemicals and iron in the rivers. The organic content rises from the river's source to its mouth, due to the developing side erosion in the plain part as well as the human activities. The main sources of river contamination are housing and utility facilities, which discharge about 95% of all polluted sewage.

The contamination degree of the river flow can be evaluated generally as «moderately contaminated waters».

The work was submitted to international scientific conference «Ecological monitoring», Turkey (Antalia), 16-23 August 2010, came to the editorial office on 29.06.2010.

Short Report

KAZAKHSTAN'S ROLE IN THE FIGHT AGAINST CLIMATE CHANGE

Akimbaeva A.M., Mamraev B.B.
S. Amanzholov East Kazakhstan State University, Oskemen, Kazakhstan

The problem of global climate changes is the topic of many international top-level meetings. The issue was first stated at the 1st World Climate Conference, which was held in 1979. In the 80-ies, the United Nations Environment Program and the World Meteorological Organization (WMO) held a number on international scientific seminars and identified the problem using a scientific approach. Responding to the growing public interest to the ecology, the series of international conferences led to creation of an Intergovernmental Panel on Climate Change (IPCC) by WMO and UNEP (United Nations Environment Program) in 1988.

Kazakhstan's attendance of the World Summit in Rio-de-Janeiro in 1992, gave a kick-start to country's participation in all main international environmental agreements: the Vienna Convention for the Protection of the Ozone Layer and the Montreal Protocol on Substances that Deplete the Ozone Layer, the UN Framework Convention on Climate Change (UN FCCC), the UN Convention on Biological Diversity and the UN Convention to Combat Desertification.

Certainly, signing international conventions and agreements does not mean an immediate integration in the world community of global ecological, economic or energy security. A real integration requires many further changes in the foreign policy, as well as in internal issues, such as authorities, civil society, legislative harmonization and development, infrastructure. Kazakhstan is currently at the beginning of the second stage of its integration into the international community.

Climate change is one of the global problems that causes concerns of many country leaders, scientists, politicians and society. Kazakhstan has been a party of the UN FCCC since 1995. On 12 April, 1999, Kazakhstan signed the Kyoto Protocol and ten years later, ratified it in March 2009. Since 1994 Kazakhstan has been discharging its commitment towards UN FCCC. In 1998, the First National Communication was prepared with foreign financial support, and presented at the 4th Conference of the Parties of the UN FCCC in Buenos-Aires (Argentina). In 2009, the Second National Communication, sponsored by the United Nations Development Program and the Global Environment Facility (UNDP/GEF), was prepared and presented. In 1998, at the 4th Conference of the Parties of the UN FCCC Kazakhstan declared its wishes to take an active part in the fight against climate change. And in 2000, the Foreign Ministry sent a note to the UN General Secretary, informing of Kazakhstan's intention to undertake voluntary obligations to reduce its greenhouse gas emissions.

At the 7th Conference of the Parties of the UN Framework Convention on Climate Change in 2001, following complex negotiations on Kazakhstan's status, it was decided that Kazakhstan will become an Annex 1 Party under the Protocol, after ratifying the Kyoto Protocol and its entering into force, according to Article 1, paragraph 7 of the Protocol.

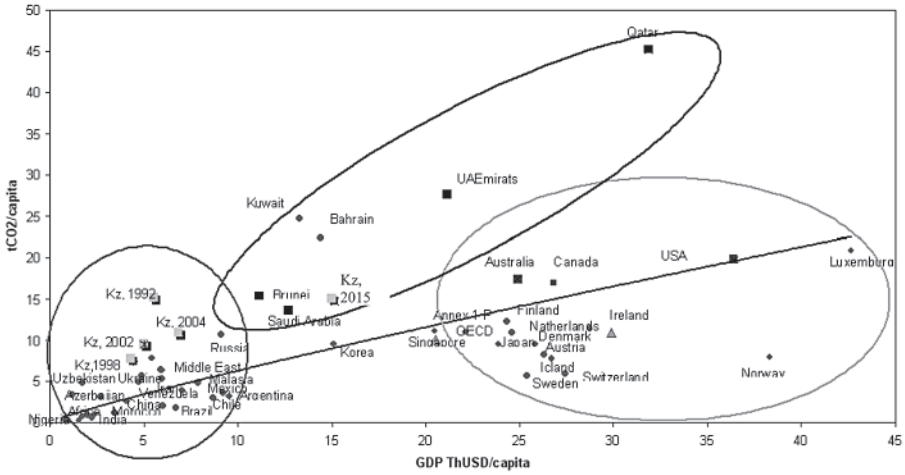
Since 2000 an inventory of the greenhouse gas emissions has been yearly carried out in the Republic of Kazakhstan, on demand of the Ministry of Environment Protection. It should be mentioned that Kazakhstan is the only country in Central Asia that conducts the greenhouse gas inventory regularly.

In 2006 in Nairobi, at the 12th Conference of the Parties of the UN FCCC and the 2nd Meeting of the Kyoto Protocol Members, the year 1992 was set as a base year for Kazakhstan. In 2008, at the Conference of the Parties in Poland, Kazakhstan declared that it undertakes voluntary obligations to cut its greenhouse gas emissions. This step has signalized to the international community that Kazakhstan aims to reduce the impact of climate change and wants to join the countries with quantitative obligations on reduction of greenhouse gas emissions. Kazakhstan has informed the UN FCCC Secretariat that it wishes to discuss a possible amendment to Annex B of the Kyoto Protocol during the next Conference of the Parties, which is to add Kazakhstan and its quantitative obligations.

Signing of the Kyoto Protocol and its consequences were a matter of discussion in the republic. In April 2005, this issue was considered by the Commission for Stabilization of Environmental Quality chaired by the Deputy Prime Minister of the Republic of Kazakhstan. The commission has instructed the Ministry of Economic Affairs and Budget Planning to explore the possibilities of meeting by Kazakhstan its quantitative targets for greenhouse gas emission reduction, and report the results to the Ministry of Natural Resources and Environment Protection.

In February 2006, the Kazakh parliament discussed the environmental, economic and political aspects of the ratification of the Kyoto Protocol to the UN Framework Convention on Climate Change. The ratification of the Kyoto Protocol was estimated positively and recommended by the parliament members. On 26 March, 2009, Kazakh President Nursultan Nazarbaev signed the law «On ratification of

Диаграмма, характеризующая отношение удельных объемов выбросов ПГ от сжигания топлива и ВВП, на человека



Correlation of specific fire emissions of greenhouse gases and GDP per capita. (Source: data – International energy agency, concept – Climate Change Coordination Center)

the Kyoto Protocol to the UN Framework Convention on Climate Change»

A number of Kyoto Protocol projects have already been carried out in Kazakhstan, including utilization of the associated gases, increasing energy efficiency, construction and reconstruction of small hydropower stations. Their results have definitely contributed, though moderately, to the reduction of the world greenhouse gas emissions and prevention of the global warming.

The Ministry of Environment Protection has begun a preliminary registration of emission reduction projects in Kazakhstan, in other words, the Designated National Authority has been established.

In our opinion, the following diagram describes the qualitative distribution of economic goods among citizens in different countries and the price of these goods in terms of the impact on the global environment and climate (according to public fond "Climate Change Coordination Center, Astana, 2009). The diagram below shows the correlation between the GDP per capita and environmental stress, i.e. greenhouse gas emissions per capita, in different countries.

All countries can be divided into three groups:

The first group (green ellipse) is represented by the leaders – developed countries with high GDP per capita and relatively high per capita CO2 emissions.

The second and the largest group (red circle) is formed of the countries, which economies lag behind the developed ones due to different reasons. This group also includes the former socialist countries.

The last group (black ellipse) includes the countries with high living standards and at the same time high level of greenhouse gas emission. These are mostly primary producers and oil-exporting countries.

The existing heterogeneity in the group of leaders is caused mainly by different emission levels. Countries, which in the recent decades invested a lot in renewable energy sources and energy-saving policy (such as Europe and Japan), differ considerably from the states that continue to run the old energy policy in the name of their economic targets (the USA, Australia, Canada). The red circle is a knot of problems, often caused by an unfavorable prehistory. These are the transition economies, which try to strike outside the red line, as well as some hopeless outsiders, which continue their endless fight against poverty. The red circle also embraces future giants of the world economy: China, Russia, Brazil, India and other.

The republic of Kazakhstan is marked with blue squares on this diagram, describing the country's development in different time periods. Comparative analysis of facts between 1992 and 2004 shows the economy's low and its sustainable growth beginning from 2000. Nevertheless, fire emissions of greenhouse gases tend to grow proportionally. The last square, which migrates into the black circle, represents the forecast – the target values under condition of industrial development and innovations.

If the blue line is the limit of sustainable development in industrial countries, then we can observe a trend in Kazakhstan's development towards it. But even by 2015, Kazakhstan will reach the black ellipse at best, i.e. will join the countries that eat away their resources. Taking into account the topic of this report, we would like to focus your attention on this conclusion.

In this respect, we feel it urgent to address the decision-making authorities and remind them that it is essential to consider the international development trends and the actions of world economic leaders when developing any long-term strategies. It should be mentioned that in the last few years, many energy-exporting countries went for the economic diversification. They provided a considerable flow of investments in the tourism sector, transport and its infrastructure, high technologies, IT and communications.

The climate change is a global issue. However, its influence on the human society cannot be automatically excluded from the scenario of world development or predicted temperature dynamics on the Earth. Some people and countries react to external effects stronger than the others, they have different abilities to adapt and cope with the constantly growing risks of climate change. Dissimilar abilities to cope with these risks sharpens the inequality of their chances. As climate change becomes stronger, it will interact with the existing structures causing further controversies and disadvantages.

Materials are based on the foresight research.

Materials of Conferences

CHEMILUMINESCENCE DIAGNOSTICS AND ANTIOXYDANT CORRECTION OF THE HEALTH DEVIATIONS CAUSED BY OXYDATION STRESS

Lesovskaya M.I.
Krasnoyarsk State Agrarian University

Oxidation stress as a misbalance between production and elimination of free radicals in organism is one of the strongest factors reducing body's adaptive potential. The oxidation stress can be initiated by different external determinants such as:

• Lack of antioxidants in food;

• Side pro-oxidant effects of medications and cosmetics;

• Inadequate doses of physiotherapeutic measures (magnet-, UV- and ozone therapy);

• unfavorable working conditions;

• artificial desynchronosis (adjustment to daylight saving and standard time).

Effective protection against environmental risks means a reliable control over the dynamics of the free radical oxidation (FRO) in the oxygen-transporting tissues. Such control can be provided by means of measuring the induced chemiluminescence (CL) in blood cells.

Luminescence as a diagnostic method has been used successfully for a long time. For example, bio-luminescence (enzyme-dependant fluorescence) is being used for environmental monitoring. Chemiluminescence (fluorescence resulting of a chemical reaction) is used in medicine to diagnose and prognosticate immune, cardio-vascular and other diseases. At the same time, mass evaluation of healthy people's resistance to the environmental risks with the help of this method, is currently not available despite its obvious advantages for effective prevention and timely (i.e. early) diagnostics of health deviations.

It is proved that the level of CL-response of activated *in vitro* phagocytes of the whole blood equally reflects the adaptive potential of an apparently healthy person (Lesovskaya, 2004). The risk of misbalance between production and elimination of biogenic free radicals under the influence of different aliments, medications, allergens and etc, can be estimated using the Fenton models ($H_2O_2+Fe^{2+}$ or $H_2O_2+Fe^{2+}+ RH$, lipids). Catalytic decomposition of hydrogen peroxide in the presence of Fe^{2+} leads to formation of reactive oxygen species, initiating FRO processes. Chemiluminescence occurs in the presence of a luminescent sound (luminol), which dies out due to the antioxidant activity or becomes stronger under the influence of pro-oxidants in test. This let estimate an initial level of FRO compensatory mechanisms in organism, as well as antioxidant/pro-oxidant potential of nutrients and xenobiotics.

An express, objective and *PC*-compatible analysis can be carried out using 36-cuvet bio-chemiluminoscent analyzer «BHL-3606-M» (Special Design-engineering Department "Nauka" of the Krasnoyarsk Science Centre, the Siberian branch of the Russian Academy of Science). FRO assessment is based on parameters I_{max} (peak height, imp/sec), T_{max} (peak access time, min), S(t) (area under kinetic curve or full light sum, million imp), $a=S_{bas}/(S_{act})$ – basal-activated light sum index; tg*a* – maximal slope of the curve to the time axis (parameters are calculated automatically).

This approach can be widely used (in human ecology, physiology, clinical and rehabilitation medicine, food and pharmacy industries, education in natural science) and has technical and economic advantages. The ratio of basal to stimulated CL-activity of the cells let range the adaptive reserves of the organism, distinguish and prevent critical conditions, which can lead to pathologies. The method is clear, quick and cost efficient. It allows to reduce several times the input of time and materials when measuring the nonspecific adaptive reactions of human body under the unfavorable conditions.

The following results speak in favor of the effectiveness of this approach. Antioxidant activity of more than 70 biologically active additives was tested; the amount of antioxidants in different food substances (fruit and vegetable juices, milk, milk products and etc) was determined; the range of the phagocyte functional activity in human blood was defined; the risk of FRO because of desynchronosis, emotional, physiological and professional stress was evaluated; safe mode of magnet therapy was determined; the side pro-oxidant effects of medications were revealed. Currently, a scientific verification of essential oil use, based on their antioxidant potential, is under development using standardized chemical and physiological models.

The work was submitted to the International Scientific Conference «Environment and development of the person», Irkutsk, 5-7 July, 2010, came to the editorial office on 20.05.2010.

THE EXAMINATION OF INFLUENCE OF SOLUTION OF ASTRAKHAN BRINE TO THE ACTIVITY OF CATALASE AT THE BRAIN OF MALE RATS

Mukhamedove N.A.[1],
Kondratenko E.I.[1], Stepanova E.F.[2],
Vetkasova N.V.[3], Igeysinov N.G.[3]
Astrakhan state university[1],
Pyatigorsk state pharmaceutical academy[2],
Astrakhan state medical academy[3]

Nowadays there is no doubt that free radical reactions take a part at the initiation and formation of pathophysiological processes that lead at the base of a great number of diseases. The toxicity of free radical compound, including supertoxic radical, hydroperoxide of hydrogen and hydroxyl radical, in a great measure is conditioned by their possibility to affect biomembranes. The aim of our work was to value the influence of bischofite comprising brine of Astrakhan salty lake to the activity of antioxidant ferment of catalase at the brain of rats.

The experiment was carrying out at 30 white pedigreeless rats with the mass of 300-350 gram. Rats were divided into 3 groups (n = 10): experience – Astrakhan brine (per os, 1,7% solution, dose 3 milliliter/kg, once a day, 10 days); the group of competition (Volgograd bischofite at the equivalent concentration) and controle (0,9% solution). The activity of catalase was defined by the methodic of M.A.Korolyka and others (1988).

The function of catalase consists at the decomposition of peroxide of hydrogen and protection of biochemical systems of cell from its toxic influence. In the course of experiment there was established that the activity of catalase at the brain of rats reliable increased at the groups of gotten the solution of Astrakhan brine and the solution of Volgograd bischofite more than in 2 times. The activity of cataase at the homogenate of the tissues of brain while the endogastric introduction of chloride sodium (controle) was 56,38 ± 9,8 nmol/l, then that in groups of animals that were gotten solutions of Astrakhan brine and Volgograde bischofite 135,3 ±6,2 nmol/l ($p<0,05$) and 115,6 ± 9,1 nmol/l ($p<0,05$) accordingly.

Thereby received facts testify to the presence of antioxidant behavior of Astrakhan brine, that indicates to the necessity of further deep researches.

The work was submitted to the International Scientific Conference «Fundamental research», Israel, Tel Aviv, 10-17 April, 2010, came to the editorial office on 21.03.2010.

Materials of Conferences

MORPHOLOGICAL STRUCTURE OF THE WEST ILMEN-HUMMOCKY LANDSCAPE OF ASTRAKHAN REGION

Bystrova I.V., Karabaeva A.Z.,
Karabaeva O.G.
Astrakhan state university,
Astrakhan, Russia

Since olden times the vital functions of population of lands near Caspian Sea is connected with water, that's why study of water resources is actual nowadays – at the century of high technologies. The development of society leaded to the considerable changes of nature of Volga lower reaches, what is conditioned by the number of factors. But the most important is the increase of anthropogenic load to all components of natural landscape of West ilmen-hummocky district, what is base reason for carrying out by the authors the complex researches.

West ilmen-hummocky district is a unique natural complex, which combines interesting hydrological and geomorphologic objects, which are the object of research, situated at the territory of Narimanovsk and Ikryaninsk administrative districts of Astrakhan region.

During last decades, as our researches, which were carried out at this territory, showed, that the majority of the elements of the landscape ilmen-hummocky district are in unsatisfactory ecological condition. It's conditioned by the intensive development of economic activity and number of natural factors. Meanwhile the scales of anthropogenic influence are so, that they lead to the breach of the integrity of separate components of landscapes, weakening of their potential possibilities to the self-repair, and also here and there to their full disappearance (separate ilmens, hummocks, erics etc).

The object of research is landscapes of West ilmen-hummocky district of Astrakhan region.

The aim of out researches is complex studying of separate components of landscape of this region.

At the territory of studying district there clearly single out three types of holes [1]: eluvial-hummocky, between the hummocks and ilmen.

All eluvial-hummocky holes are oriented in the sublatitudinal direction. Their absolute marks vary from the minus 3,8 m to minus 15,8 m. The configuration of holes of this type is clear in the plan slightly sinuous. Relative height reaches 5-15 m, square varies at limit from 46 to 150 m.

These holes of hummocks were formed by the different-age rocks of sedimentary origin. Rocks have in their composition organic and inorganic debris. First are represented by scanty small debris of shells of sea mollusks, second are represented by the debris of gypsum, pellet of metamorphic rocks, inclusions of manganese and efflorescences of different readily soluble salts. For occurring layers there is character the fast change as by vertical line, thus by horizontal line. The soil at the limits of this type of holes is brown, they are poor of humus and mineral compound.

Between the separate holes there are no clear border observed. The passage to the between the hummocks depression and ilmens is gradual and smooth.

At the limits of holes of hummocks one single out three types of facies: northern slope of hummock, top of hummock, southern slope of hummock.

Fcies in the composition of hummocks' hole have identical geological, lithologic, mineral and organic compound.

The holes of other type are between the hummocks depressions or between the hummocks holes. Absolute marks of bottoms are from minus 25 m to minus 27m. They are oriented as the hummocks in sublatitudinal direction. The width of between the hummock holes varies from 0,3-0,6 km to 2-25 km. Their bottoms in the plan are slightly cured, rarer they are flat. In the percent correlation the square of researched lot of between the hummock depression (not occupied by ilmens) is about 17-19% from the square of West ilmen-hummocky district.

The holes of between the hummock depressions are formed by the rocks of sedimentary origin and exceeded by modern lake-liman sedimentations. At the lithologic approach they are represented by sandy-loam or loamy differences.

The soil at the limits of these holes are ilmen-meadow, well moistened with the developed humic horizont with the facility till 20 sm. Here and there there are met salted places. The type of vegetation depends from the degree of their salinization and moisturizing.

Between the hummocks depressions full of water are called ilmens (local name). Holes of ilmens are oriented as the hummocks in sublatitudinal direction. The configuration of ilmens in the plan is sinuous. It's length is 0,7-2,0 km, width 25-250 m, relative depth 0,5-1,5 m. Bottoms are flat or slightly concaved, slopes are gentle. The square, which is occupied by holes of this type at the limits of researched lot, is 34-36% from the general square of district. The character of

the borders of ilmens is clear and observed by the decrease of moisturizing of the soil, change of their colour, compound, change of the character of vegetable cover.

At the limits of holes of this type we single out two facies: mirror of the water and near ilmen.

Facies – the mirror of the water or ilmen itself are situated in the dished pricks. The water in them is fresh or slightly salt. The degree of its saltness depends on the presence or absence of connections of facies of this type between each other or Volga river and the character of their connections.

This facies is sharply (on the waterside line) pass to the next one – near ilmen. Such facies more often broadens with the facies of the slopes of hummock and the mirror of the water. The passing to the second type of facies will be sharp, and to the facies of first type – depending on exposition of slopes, their steepness and width of near ilmen part.

Morphological structure of landscapes is in dependence on many natural conditions:

1) quantity of solar radiation, which is got to the unity of square;

2) circulation of atmosphere;

3) relief of territory;

4) nearness of water sources;

5) character of underlying surface;

6) type and moistening of soil.

Thereby, even at the limits of researched lot, comparatively small by its square, we can observe how by the influence of some or other factors occur different changes in nature of holes and facies of the same type, what can lead to the transformation of landscape in whole.

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Materials of Conferences

OCIAL-ECOLOGICAL FORMATION STUDENT (some results of the study)

Shilova V.S.
Belgorod State University Belgorod, Russia

It's clearly that as the most important element of pedagogical process at the institute of higher education there singles out the contents of education. Just it is a necessary mean of progress of the different level goals of education and training and it also is a program of corresponding activity. The category "the contents of education" reveal by different ways: pedagogically adapted system of knowledge, skills and abilities, experience of creative activity and emotional-volitional relations, which guarantees the forming of comprehensively developed personality that was prepared to the reproduction and development of the society's culture (I.J. Lerner, M.N. Skatkin and others); the contents of education consists in the bases of sciences, educational standards, social science knowledge, intellectual, labour and other skills and abilities, different types of cognitive activity, the phenomenon of culture, spontaneous participation at different kinds of labour, sporting, social, political and entertaining measures (B.T.Lykhachev, V.A.Slastenin) [1].

The object of this work required the definition of mean of social-ecological education of students (SEES), and while taking into account the principles that were formed at the main normative documents; the achievements of pedagogical science at the sphere of ecological and social-ecological education. In connection with this it should be necessary noted that the problem of contents of whole ecological education is actively developed nowadays by N.M.Mamedov, S.N.Glazachevym, I.T.Suraveginoy and by other scientists [2]. But as the researches show if the necessity of ecological education at different degree of education is undeniable that from the other side by the fair remark of N.M.Mamedov, there are revealed a lot of uncertainties at the object field, composition of ecological disciplines as obligatory at the school's and university's education. Is very much to the point his other remark about that the considerable part of ecological education should be allocated to the social-educational [3]. All this allowed us to formulate the number of concrete tasks, which concern the contents of social-ecological education of students: the development of its essence, object field, structure, normative realization.

At the definition of the essence of the SEES contents as the initial position singled out the essence of contents of social-ecological education of students, which was formulated by us at 1999. We should remind that at the general appearance it consists firstly at the system of knowledge about the interaction of society and human with the natural environment; about the means of this interaction that allow to form the integral picture of the world surrounding the human and to master the system of methods of cognition of real social-ecological reality and practical activity in it. At this system there is included the knowledge of principal objects of the environment: nature, society, human and technology. Secondly the contents includes the system of such intellectual and practical skills and abilities that promote the establishment of real connections with all the elements of the environment and that then became the base of further activity in it. Thirdly the cumulative experience of creative activity that conditioned by the variety of real world and by the necessity of peculiar approaches to its mastering, assistance to further development. Fourthly the experience of emotional-valuation, volitional attitude to the social-ecological reality, to its each element, to oneself. This will guarantee the formation of psychological readiness of personality to the optimal connection with the natural environment, to the conviction of its obligatory saving, to restoration and renewal, to digesting of system of social-ecological values [4].

But formulated definition develops principle regulations of the educational contents, which then are concretized according to the conditions of educational establishment. At the system of higher professional education, in opinion of many specialists (N.F.Talysyna, I.A.Volodarskaya, S.D.Smirnov and others), at the process of development of the contents of the courses it's necessary to take into consideration following factors: "output" and intermediate aims of university's education; the presence of three (as the minimum) invariable components of contents: object, logical, psychological, that means special and nonspecial blocks of knowledge, skills, abilities. As the most important condition of selection of contents of higher education N.F.Talysina calls the necessity of separation of fundamental, invariant knowledge. It, in the author's opinion, allows to draw other particular cases according to singled out factors and main strategy aim of preparation of specialist at modern conditions – formation of human ecological, professional, able to assist to the further steady development of the society; and also the tendencies of ecologization of contents of all degrees of education; construction of the main blocks of contents of social-ecological education of students. In compliance with the viewpoint of Talysina N.F., Smirnov S.D. at our research there are remain obligatory blocks: object, logical,

psychological [5]. Other researchers, particularly Deryabo S.D., Yasvin V.A., substantiated single out five substantial blocks at the system of professional preparation of pedagogues to the realization of main ecological education: ecology-theoretical, ecology-humanist, naturalistic, psychology-pedagogical and methodical [6].

It should be noted that the idea of ecologization and pedagogization nowadays is realized at the contents of higher education. The analysis of active educational plans of different specialties, which was carried out by us, showed the degree of such realization. It was established that at the educational plan there is widely presented professional block that reflects the specific of contents of separate specialities, which opens at some educational disciplines; logical and psychological blocks are represented by philosophical and psychological disciplines. What concerns social-ecological block it is reflected unevenly (by its volume) at the structure of educational plans. At the biggest degree there are ecologizated the educational plans of geology-geography faculty, that is connected with the specific of the studying object; at the smallest degree – the educational plans of humanities. With regard to the pedagogical block there is similar tendency: teacher specialities are more pedagogizated, that can be said about other specialities, for example juridical. But recently there is clearly single out the necessity of the filling of contents of higher education with pedagogical disciplines. The example can be the introduction of some of them into contents, for example, medical, geographical, economic education. There were developed by the workers of the cathedra of the pedagogy of Belgorod State University pedagogical courses that are adapted for different spesialities and that connect some profession with the peculiarities of interaction with the people at the frames of chosen speciality (for example, the system "doctor – patient", "administrator – subordinate" etc).

Formulated earlier definition of the essence of social-ecological education of students opens, as it was already mentioned, the most general regulations, which then should be concretized in compliance with the conditions of educational system. The analysis of works of Arkhangeskyi S.I., Talysina N.F., Smirnova S.D. and other scientists allowed to single out typical for the university conditions and to define the essence of the contents of social-ecological education of students. This essence is probably consists in the system of knowledge, skills, abilities, creative and emotional-valuable attitude that reflect naturally-scientific, anthropological, technically-technological, social and psychologically-pedagogical aspects of the interaction of personality with the natural environment. Singled out system of contents is conditioned by the objectively existed system "nature-society" (or "nature-human-technic-society") (N.M.Mamedov, A.D.Ursul, V.D.Komarov and others)(7).

In consideration of the opinion of N.F.Talysina, who fairly insists on the the necessity of separation of fundamental obligatory knowledge, the place of content of SEES at the contents of higher education stands at the system of interdisciplinary (various) blocks, at the composition of which there are included: ecological and pedagogical blocks, and at the same time at the composition of basic (invariant) components there are included: logical, psychological and object blocks. All blocks (invariant and variant) are connected together, that is conditioned in the final by the objective law of the universal connection of objects, processes and phenomenon of actual reality and by their reflection at different forms of social mind.

And with it there arises the necessity of solving the other task at the context of the problem of the contents of social-ecological education of students – the definition of the corresponded object field. On the assumption of that SEES reflects objectively existed elements of social-ecological system – "nature-haman-technic-society", that it's logically to suppose that object field should be consisted with science disciplines that reflect tis elements. As such disciplines we label: naturally-scientific, which open nature at all its variety (geology, geography, physic, chemistry, biology, mathematics and other); anthropological (biology, medicine, physiology of human and other); technical (technic and technic of production and other); sociological (philosophy, sociology, history and other); objects of psychology-pedagogical cycle. Each of disciplines singles out as the source of the development of complicated integrated social-ecological contents that opens at the base of the connection between blocks.

That is to say the contents of SEES includes natural-science, anthropological, technically-technological, sociological, psychologically-pedagogical blocks, the possibility of integration of which is presented at the course of social ecology, oter integrated courses. It should be noted that the presence of these blocks at the contents of modern higher education is reflected at the active educational plans of different specialities. Their analysis showed that each of blocks separately is rather fully presented almost at every speciality, except some philological, juridical, social-psychological. And with it each of blocks present itself rather independent discipline, almost isn't connected to other blocks. It does not allow to solve problems of formation of complicated social-ecological knowledge, skills and abilities, experience of creative and emotional-volitional attitude to nature that require integrative base. From here appear the

necessity of further search of conditions that promote not only development of complicated contents SEES, but also its formation at the university.

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THEORETICAL PREMISES OF THE DEFINING INTEGER AND PROBLEMS SOCIAL-ECOLOGICAL FORMATION STUDENT

Shilova V.S.
Belgorodskiy state university
Belgorod, Russia

The research of problem of the aims and tasks of socially-ecological education of students requires the revealing of necessary theoretical premises, the formulating and specification of the content of the aims, definition of their levels. The most important formation is this case singles out, firstly, the essence of category of the aim, which is defined in modern scientific knowledge.

Philosophers, for example aim, define as the anticipation in the in the consciousness of result, to the reaching of which there is directed the action; as the motive the aim direct and regulates the action, pierce the practice as the inside law, to which person subordinates to his will. Aim defines the active side of human consciousness, should be in accordance with objective laws, real possibilities of environment and the subject itself (I.T.Frolov). The aim is one of the elements of behavior and conscious activity of person, transformation of environment. It's objectively conditioned; it's connected with objective necessities, due to which it singles out as ideal, inherently made motive of production, defines not only law, but way and type of actions of person. The aim is the way of integration of different actions of person to some succession or system, the stimulus to the building of the project of action, which defines the character and system orderliness of different acts and operations (D.M.Gvishyani, N.I.Lapin). Modern western philosophers define the aim through the reasonability; target explanation take the action out of its aim, his goal; target explanation tells us "why" there is occurs the event (D.Julia) [1].

At the psychological scientific literature the category of aim is opened roughly in one channel. Thus, Rubinshtein S.L. connects the aim with the result and motive of activity, separate action; notes that the direct aim of socially organized person's activity is carrying out of defined social function. Leontiev A.N. names the aim as main forming activity or actions, distinguishing while this the aims of outer practical activity and outer activity; the mean of aim A.N.Leontiev corresponds with the mean of action, at the same time when the mean of motive with the action in whole; aims and motives in activity should not coincide: one motive can cause different aims and from then different actions. While this, A.N.Leontiev noted the objective and conscious character of the aim. The aim singles out as central systemizing component of psychological system of activity and reveals in two cases: firstly, as its ideal and mentally imagined result; secondly as the level of reaching, which person try to achieve (as the task to reach defined indicators) (V.D.Shadrikov) [2]. To the present time there are researched the aims of any different types of activity: professional, labour, playing, scientific, creative etc.

The defined interest for this research is the category of aim, which is opened by pedagogic science. At the psychologically-pedagogical dictionary (1998) the aim of formation supposes anticipated at the thinking results of participation of person (population) at different educational programs. There

discern two types: pedagogical, which are directed to the enrichment of sets, understanding, knowledge and skills; social, which suppose the humanization of interests of personality and society, their corresponded progress. Reflecting the functional role of the aim, Babanski U.K. consider it as the initial component of pedagogical activity and pedagogical process itself, connects it (the aim) with the formulating students' system of different knowledge, skills, abilities, world outlook, active life position of personality, with the development of skills and abilities of educational activity, with the psychology of the process [3].

Some kind of unusual for traditional understanding there is offered a viewpoint of V.A.Slastenina, A.I.Myshenko, who take away the aim from spontaneous frames of pedagogical system, explaining it by the understanding of the aim as the multilevel phenomenon. The aim singles out as premise, and as inside inherent to the content phenomenon; at the means the aim is also present in the obvious and unobvious view, functions at the level of cognition and reveals in activity. The authors especially note that the aim, as the expression of social order of society, is interpreted at the pedagogical terms, singles out as the systemizing factor (not element), that means the outer strength against the pedagogical system. Pedagogical system is organized with the orientation to the aim [4].

The specific analysis of category of aim at the pedagogy, its statement was carried out by E.V.Bondarevskaya and S.V.Kulnevich. As the parameters of their analysis, the authors single out: the idealization and ideologizing of aims, its technocratism, correlation with the means of realization. As the global aim of upbringing authors consider the formation of person of culture. The necessity of selection of the general aim in the work of pedagogue, in the opinion of authors, has principle methodological meaning, because it defines the main direction of his activity. The way while the moving from the general aim to the final result of upbringing supposes the development more particular (functional) aims, their classification and systematization, which in turn can be carried out by different bases, for example: system-component analysis of personality; components of moral development of personality; behavior etc. [5].

At the context of object of our research the necessary is the examination of several target groups: the aims of ecological and socially-ecological education; aims of professional preparation. To nowadays there are rather clear defined the aims of ecological education of pupils (I.D.Zveryev, I.T.Suravegina, A.N.Zahlebnyi and others). In the grounded opinion of Suravegina I.T., the main aim of ecological education of pupils there singles out the formation of ecological responsibility, which supposes, on the one hand, attitude to one's health, on the other hand, attitude to environment: nature and social. This aim is concretized for each stage of education. Each aim, notes Suravegina I.T., has not only ideological, but also scientifically-cognitive tint, what complicates the process of education and requires from the teacher the further concretization of tasks [6].

What concerns the system of professional preparation, particularly, at the stage of higher education, there is carried out an active search for the aims of ecological and socially-ecological education. Thus, the aims of ecological education of students are connected with ecological imperative at the process of development of civilization and improvement of human (Egorova G.I., Paderina M.A.); with the formation of anthropo-ecological, value consciousness and style of thinking, communication and activity (Pak M.S., Shitova I.F.); with the ecohymanist paradigm (Grudzeva N.V.) etc [7]. A lot of scientists, for example, S.N.Glyazachev, E.A.Kogay, as the aim of ecological education at the system of professional education consider the formation of personality, the nucleus of which there singles out the ecological culture that provides the versatility and harmonicity, integral ideology; overcoming of alienation of personality from the nature and society, ecological orientation in macro- and micro environment. With it, at the ecological culture the authors consider not only the aim of ecological education but also the way to the ecological safety, formulating of qualitatively new culture, which reflects the integrity of world at the base of its practical, intellectual and spiritual understanding [8].

The spontaneous connection between professional and ecological education there establishes N.M. Mamedov, who fairly consider, that in modern conditions scientific knowledge should help the future specialist not only to sort the processes and phenomena of the nature, complicated situations of life, but also act knowingly. The aim of modern education, notes the author, becomes not only digesting of the bases of the sciences, but also the forming of methodological orientations and operational thinking. Defining the aims of preparation of specialist, Mamedov N.M. states to their difficult character, to the necessity of forming of knowledge, skills, abilities, which are necessary for the reaching of such decisions, which don't break the stability of socecosystems, assist the saving of nature systems, careful attitude to the resources of biosphere. We should agree with Mamedov N.M. at the defining of the aim-ideal, and just – the formation of the ecological person. To approach to this aim there will help, in the opinion of the author, the reaching of strategic aim of ecological education – upbringing of responsibility as the measure of freedom of person in conditions of ecological necessity [9].

Mentioned general aims of ecological education at the system of preparation of specialist don't

contradict the aims of professional education. Thus, Fokin U.G., Novikov A.M. as one of the base aims consider the creation of conditions for the owning of professional activity, reaching of qualification (or requalification) for including the person into a socially helpful labour in correspondence with his interests and abilities [10]. Obviously, that selection of this aims is connected, on the one hand with labour activity, as the process, which is carried out between the society and nature; on the other hand with personal qualities, which promote the establishment of harmonious relations with environment the process of labour, that allows to predict these relations in the near and far future.

It should be noted that one of the foundations of formulating of aims of upbringing last time there singles out a system of values. To this fact there pay attention Nikandrov N.D., Gershunski B.C and others. There is fair the note of for example, N.D.Nikandrov, who notes the desirability of correspondence of the aims of upbringing of really functioning at the society the system of values. The upbringing of person in these values is the right decision of the problem of the aimsof upbringing. And with it, in the opinion of Gershunski B.S., restructuring processes in our country laded to the destruction of former system of values, new is not yet created, therefore there is problematic the defining of the aims of upbringing of younger generation [11].

Thereby, for defining of the aims of socially-ecological education of students, as one of the basic types of activity, nowadays there are a lot of reasons. At the process of their development and in compliance with the opinion of Nikandrov N.D. we have stated that, on the one hand, values define the contents of the aims of socially-ecological education: objective and integral. On the other hand – the direction of the system of socially-ecological education of studying youth to the main socially-ecological universal values: objects (nature and society, or, if we widen the object of socially-ecological science, thus: nature-technique-human-society), integral formations (socially-ecological culture, readiness of personality for optimal interaction with the environment, the content of socially-ecological education) [12].

Just these values allowed us to formulate corresponding multilevel aims of socially-ecological education of students: strategic, tactical, efficient. Their digesting formulates the position of the personality of student relative to base elements of the environment to the side of harmony, what promotes further stable development of society and state.

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Materials of Conferences

THE RELATIONSHIP BETWEEN DECISIONS AND KNOWLEDGE

Askerov Sh.G.
Baku State University

The picture of world's development during last hundred years shows, that side by side with big scientific and technical progress there also occur scale regressions: two world wars, global warming, breach of harmony between economical and spiritual development, wide spread of drug business and of weapons of mass destruction, ecological problems, replacement of more fair social foundations by less fair, presence of double standards etc testify to the presence of considerable shortcomings at the general development of humanity. The truth can't defeat the lie. The number of problems considerably exceeds probable ways of their solving. All these cataclysms are the result of wrong decisions, which were reached at the global and local level. One of the west thinkers has characterized philosophy of development of last century like this: "when the last tree is cut, when the last fish is caught, when the last river is poisoned, people will understand that money is not edible."

All these undesirable phenomena that have place at the development of humanity indicate that old criterions and measures of values definition lost their power and there is a necessity in new methods of assessment. At one old aphorism saying goes: "there is no bigger happiness than the measure, measure is the base of harmony". If harmony was broken, that means, there are necessary new ideas, models, criterions and measures.

All these deviations from the straight and narrow are implicity connected firstly with insufficient level of scholarship of elite stratum of planet's population. Secondly with the absence of true methods of value assessment, including assessment of knowledge of students.

Every day each officer (or person) reaches tens of decisions. Per annum the number of such decisions, which are reached by person, averages many thousands. Obviously not all reached decisions are perfectly true, the part of them undoubtedly false. The reason of these mistakes is hidden in shortcomings that occur at the educational systems. Between mistakes, which are made while reaching of decisions at the system of direction and at the system of education, there is interconnection. The aim of this work is to reveal this connection.

At previous works [1-2] there was offered new nonlinear scale and new criterion of knowledge assessment and as the model there was suggested to take the glass of liquid. There was suggested that liquid that is situated in the glass is the "liquid of knowledge".

Let's mark the height of full part of glass as Lk, empty part as Ld, and the overall height as Lo. Apparently, these parameters are interconnected:

$$Lo = Lk + Ld . \qquad (1)$$

As the new criterion there was suggested to consider ratio of length of segment Lk to the segment Ld. At previous works this ratio was called the factor of quality and was marked with K letter. There K acts as the new criterion of knowledge assessment, because:

a) in case when $K >> 1$, $Lk >> Ld$, the educational system is irreproachable.

b) in case when $K = 1$, $Lk = Ld$, the educational system has the middle condition.

c) in case when $K << 1$, $Lk << Ld$, the educational system is absent or it is paralyzed.

In the first case (a) the digested part of material is much more than undigested one. In the second case (b) they are equal. In the third case (c) the digested part of material is much lesser than undigested one.

If we divide both of sides of formula (1) to Lk, we'll receive the formula:

$$h = \frac{1}{1+K} . \qquad (2)$$

It's easy to understand that h characterize the shortcoming of knowledge, more exactly the relative value of missing knowledge or "ignorance". As we see from the formula (2), with the increase of K, the relative value of "ignorance" – h decreases.

It's clearly that when:

a) $K \to \infty$, $h \to 0$; studying educational material was fully digested.

б) $K \to 0$, $h \to 1$; studying educational material was fully undigested.

The meaning of these results consists in that it creates the possibility of creation of interconnection between relative error of reached decision and relative shortcoming of information (ignorance). At the work [3] there was shown that error of decisions is proportional to lack of information:

$$\Delta Q = c\, h . \qquad (3)$$

Here, ΔQ is an error of reached decision, c is the coefficient of proportionality. ΔQ is defined by formula:

$$\Delta Q = Q_{a} - Q_{т}.$$

Here, Q_a is absolutely right decision, Q_c is current decision. Obviously, that while the approaching of Q_c to Q_a, the error of decision ΔQ approach to zero.

In consideration of (2) in (3) we receive:

$$\Delta Q = c\,h = c\,Ld / Lo = c1\,Ld\,. \qquad (4)$$

where, $c1 = c / Lo$. From the formula (4) it follows that while $L\,d \to 0$, $\Delta Q \to 0$ that means that there was reached a error-free decision. It's clear that it happens only when $K \to \infty$.

For example, if one of the students from 100 questions rightly answered on 98, and other student on 88, then obviously that lack of knowledge fro first student will be 2%, and for second student will be 12%. It's obviously that error of reached decisions in conditions of big values of knowledge's lack (12%), accordingly will be considerably bigger as compared with first student.

Thereby we receive that error of reached decision depends on the level of incompetence of individual. To right decisions we can go by means of irreproachable education. In that consists the philosophy of struggle for qualitative education.

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SELFIDENTIFICATION OF THE MORDVINS BASED ON THE POLL OF 2007

Abramov V.K.
Mordovian State University
Saransk, Russia

At the frames of Finland-Russian project of 2005-2008 years "About the regulations of Finno-Ugric nations of Russia", there was carried out the poll of population of 13 regions of Russia by the whole number of problems, including the problem of definition of the nationality. While this all questioned Russians, Tatars and others called their nationality equally: Russian (woman), Tatar (women), Chuvash (woman) etc. Some alternative versions had Maris: "Mariec (Mariika) or Mari. The biggest variety had the answers of Mordvins. Women had 13 types of answering: Marostava, Moksha, Mokshanka, Mordvin, Mordvin-Moksha, Mordvin-Erzya, Mordvinian, Mordvinian-Moksha, Mordvinian-Erzya, Erzya, Erzya-Mordvinian, Erzya-Mordvinian, Erzyanka (erzya, moksha are subethnoses of Mordvins, marotava word for word is "mother-earth" – V.A.). Men had nine names. It should be mention that generally they are widely spread and this testifies to the full confusion in this sphere. For example, in the Ulianovsk region all 68 of respondents-Mordvins answered that they are "Mordvins, Mordvin women". In the Samara region the base mass of questioned declared that they are "Mordvins, Mordvin women". In Bashkiria among the 35 of respondents 32 of them found themselves "Mordvins, Mordvin women" etc. The biggest confusion is observed at the Republic of Mordovia. Here, speaking about nationality of their mothers, Mordvins 197 times wrote "Mordvin", 88 times "mordvinian", 17 – "Erzya or Erzyanka", 10 – "Moksha or Mokshanka". The mothers of respondents, who called themselves Russian had the term "Mordvinian" 42 times, "Mordvin" 38 times etc. It should be noted that these alternative versions doesn't testify to the presence of some essential, just national differences at the Mordvinian sphere. Thus, from the respondents-Mordvins, which were questioned at the frames of mentioned project, 96,1% classed themselves to the Mordvinian nationality and only 3,9% didn't mentioned it while answering on this question. That means that the problem consists not in the tendency to the disintegration of united nation, but in the unification of term that reflects its unity. From the norms of Russian language there follow: "Mordvin, Mordvin woman, Mordvins" as the indicators of nationality (by the analogy "Lett, Lett woman, Letts"); "Mordovets, Mordovka, Mordovtsy" as the indicator to the place of living ("Latvian, Latvian woman, Latvians"). But in official documents there are used terms: Moedvin, Mordovka, what confuses this question.

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Materials of Conferences

PROBLEMS OF DEVELOPMENT OF TWO-LEVEL HIGHER EDUCATION IN RUSSIA

Bogolyubova S., Bogolyubov V.,
St.Peterburg State University of Engineering and Economics, Russia

Higher education is directly and mediately related to national economics, science and social culture. Therefore its development is an important part of general national development strategy. Assuming success of higher school, we can't neglect the fact, that with indisputable success in progress, the quality of our graduates doesn't meet modern demands. It is revealed by the fact that we have one of the greatest engineering and economic manpower potential, and at the same time we are significantly behind from world level in quality of products and services, average productivity of labor, reached in the world.

Last years heavy discussions in Russia are in the first place concerned about reforming the higher school. There are many points of view, but most of the offered decisions are not systematical and are aiming to solve only one detached objective.

But the government's voice has a peremptory tone and says about obligatory transition of traditional education system to Two-Level educational system according to Bologna Process. They are assuming that this system will definitely lead Russian Higher Education to world level, and will let graduates be competitive and demanded in national and world economics.

We believe that in this case takes place a substitution of an essence of education by forms of education. A fortiori, if with reforming the form of education we don't reach the goal, then, a priori the "bad teachers" are to blame. However we suppose that Higher Education in Russia including economic education is an integral system that shows problems of society and economics in tote. These problems can't be solved only with transition to multi-level education of students.

It is known that requirements to education of a specialist are being formulated beyond the education system. They are formed according to common economic, and social purposes of government, demands of employers. Ability to predict and foresee development of higher professional education – is one of the most important conditions of its successful functioning.

Our research allowed us to provide first-priority objectives in reforming Higher Education in Russia:

– search of new more flexible and efficient structural forms of education, which reflect demands of society and capabilities of present education system (dynamic balance between potential and demands with leading role of social and employers' orders) in conditions of limited resources;

– solving problems in interactions of different parts of education system, which can be assumed as development steps from simple to complex;

– organizing education quality control and correspondence of education system to defined goals and society demands;

– filling in the present educational constructions, development of a supporting mechanism which ensures self-development of education system, optimal correlation between educational components;

– seek of way to integration into world education system;

– revelation of specific mechanisms to realization of educational demands;

– economical and legislative support of qualitively new forming of an education system.

Peculiarity of multi-level education – is an appearance of different educational objectives on different levels (steps) of training. The main objective on each level is forming a creative thinking and conditions for self-actualization

First level – activization of traditional types of educational activities (problem and "no-writing" lectures, press-conference-lectures and etc., dialogue seminars, role-based seminars and etc.)

Second level – Activization of informational education technologies; their variety and problem, lessons in classroom, and also during students self-work (computers, movies, television and etc.) And the same time methods of active education are essential

Third level – Context approach, application of knowledge and abilities in solution of quasiprofessional objectives. Wide implementation of active (including business play and gaming simulation) and informational education technologies.

Education of Masters – lessons with research elements, participation in real business games (innovative, business problem-solving, organizing-and-acting).

There are some reasons to suppose that the form of education is not the dominant factor in education of the higher qualification cadre, but the content of education, contained in study plans and programs supported by society and government with essential resources for high quality education of competitive graduates on labour market.

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TIME LINES AND THEIR APPLICATION IN EDUCATION

Dobrynina N.F.
Russia, Penza

Time lines is one of the most important object of statistic analysis. As scalar time line there is called a massive from N meanings of some dynamical system with constant step $\Delta t: x_i = x(t_i)$, где $t_i = t_{i-1} + (i-1)\Delta t, i = 1, \ldots, N$. The is examined a process of teaching at the higher education institution (university). As the x_i we consider progress at the end of semester, Δt – time interval with the length of one semester, x_0 – progress by the results of Unified State Examination, N – the quantity of the educational semesters. Such statistic model we can build for the prognosis of progress at the end of one semester by the control points of calculation of progress during one semester. As there are no more than three control points at one semester, that the prognosis at the short interval should be with the big error. The calculations were leaded by the statistical facts of progress by the mathematics at the speciality "Applied mathematics" of Penza state university, where different sections of mathematics are taught during 10 semesters.

The treatment of statistic methods is based on the treatment of statistic model. At the statistic model the accent is underlined at the noise. For exit facts we have character distribution and character time correlations. The task of treatment consists in that thing to build a model such way, that is transform noise into a time line. At this way of building a model we can either demand the coincidence of several points of distribution, or use more complicated characteristics, such like the density of distribution. At the first stage we will require the coincidence of several points of distribution.

We know a time line x_i. At the each point we can create a "noise", this is a succession of uncorrelated and equally distributed accidental quantities ξ_i with the zero average. Let's suggest that i element of the line x_i we can consider as some function, which depends on m of preceded elements $x_{i-1}, \ldots, x_{i-m}$ and accidental quantities $\xi_i, \ldots, \xi_{i-k}$:

$$x_i = F(x_{i-1}, \ldots, x_{i-m}, \xi_i, \ldots, \xi_{i-k}). \quad (1)$$

For the beginning one can limit oneself to the linear functions F, to the models of type

$$x_i = x_0 + \sum_{j=1}^{m} a_i x_{i-j} + \sum_{j=1}^{k} b_j \xi_{i-j}. \quad (2)$$

Such model is called ARMA from the words autoregression (first sum) and sliding average (second sum). The coefficients ai, bj are found by the method of the least squares. This type of models is good for the prediction of next mean by the m previous. The real calculation of progress in maths in every next semester corresponded to the built model with little deviation and the error didn't move over the limits of hundredth parts of the percent. While the studying of statistic models there were used following literature [1, 2, 3].

More exact prognosis of progress we can receive if we use the average mean of predictable quantity:

$$\hat{x}_i = Ex_i = a_0 + \sum_{j=1}^{m} a_i x_{j-i}.$$

It's suggested that previous means are known exactly. The noise is the compound part of linear models and linear prognoses can be done to the small number of steps forward.

The correlation (2) is a discrete analogue of compression of two signals: x(t) and ξ(t) with the finite functions a(t) and b(t):

$$x(t) = \int_0^T a(\tau) x(t-\tau) d\tau + \int_0^T b(\tau) \xi(t-\tau) d\tau.$$

The interval [0, T] is considered as the interval of time of teaching of one section of mathematics of one semester length or, at the more general case, the whole period of studying maths at the higher education institution.

Using the transformation of Fourier $X(\omega) = \int_{-\infty}^{\infty} x(t) e^{-i\omega t} dt$, we get a compression:

$$X(t) = \int_{-\infty}^{\infty} a(\tau) y(t-\tau) d\tau.$$

At the result of transformation of Fourier we get an expression:

$$X(\omega) = A(\omega) X(\omega) + B(\omega) \theta(\omega).$$

If we solve this equation concerning X(ω), we'll receive

$$X(\omega) = \frac{B(\omega)}{1 - A(\omega)} \theta(\omega). \quad (3)$$

The selection of the functions a and b allows to transform the spectrum of noise θ(ω) such way, that it become analogous to the spectrum of analyzed signal.

Built linear model (2) is convenient that which it gives analytical results and its use doesn't require a lot of mechanical time.

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Materials of Conferences

LONG-TERM ASPECT OF THE KAMA RESERVOIR WATER BALANCE

Kitaev A.B.
Perm State University, Perm, Russia

Water balance and concerned with it water exchange define in a greater or lesser degree all elements of a regime of natural and artificial reservoirs. Since level fluctuations are connected with change of water balance elements it has affect on variance of morphometric characteristics. Although water balance of reservoirs is identical in structure with water balance of lakes it differ a number of specific features in a behavior and proportion of input and output elements. Singularity water balance of reservoir is caused first of all by repercussions of complex interaction between natural and anthropogenesis factors. Anthropogenesis factors define nature of water input and water output in reservoirs with cascade of hydroelectric power stations.

For the first time the average of mean annual sizes of water balance elements for a long term for the Kama Reservoir was defined by V.I.Ponomarev, E.A.Snegirev, L.I.Ponomareva in Recurs Poverkhnostnyx Void SSSR (part 2) (Recourses of a Surface Water of the USSR). The information from 1956 to 1967 had been generalized by the authors.

In concordance with data of water balance from 1956 to 1993 annual reservoir inflow from master river (Kama) was 29,76 cubic kilometers (53,18% from water input). This value is just over the similar size based on data for shorter period of estimation from 1956 to 1967. This information is presented in Recurs Poverkhnostnyx Void SSSR (Recourses of a Surface Water of the USSR). Lateral inflow for longer period is 24,08 cubic kilometers (43% from input). Lateral inflow for shorter period is 24,56 cubic kilometers (46,3% from input). The unchanged cumulative value of water from master river and from lateral inflows is 54 cubic kilometers. The meteorological precipitation value is also unchanged. In concordance with data from 1956 to 1967 it is 0,92 cubic kilometers or 1,6% from hydrologic equilibrium input. In concordance with data from 1956 to 1993 it is 0,93 cubic kilometers or 1.66%.The annual water from floating ice and from snow for a long period (0,47 cubic kilometers or 0,84% from input) is less than for short period (0,50 cubic kilometers or 1,0% from input). In concordance with data from 1978 to 1993 annual trade waste discharge value is 0,72 cubic kilometers or 1,29% from water migration into reservoir. Because of lack of trade waste discharge data, it is impassible to compare two periods.

The total reservoir inflow for a long period (55.96 cubic kilometers) is higher than the total reservoir inflow for a short period (55.41 cubic kilometers). The difference is caused by accounting of water entry from industrial sewage. If this element was considered in annual water balance for a shorter period, total reservoir inflow for a short period and total reservoir inflow for a longer period would be the same.

The basic account component of water balance of a reservoir is the size of water spill through hydroelectric power station turbines. During 1956-1967 its size has constituted in an annual balance 51,68 cubic kilometers (97,6% from a water-resources output part of balance). For the long period it became higher – 52,78 cubic kilometers (95,89% from input to a reservoir). The size of water loss by evapotranspiration from a reservoir surface for both compared periods are identical and constitute 0,79 cubic kilometers (1,5% from the discharge for the short period and 1,4% – for the long period). The stranded ice loss for the long period became shade less (0,46 cubic kilometers or 0,83% from the discharge), than during the short period (0,51 cubic kilometers or 0,9% from the discharge).

Since 1978 making up of water balance began to consider a value of a travel of water through a dam (Ф). During 1978-1993 its annual size has constituted 0,51 cubic kilometers or 0,92% from a discharge part of balance. Even more, during the same period began to consider lockage losses (Ш) (the annual size has constituted 0,08 cubic kilometers or 0,14% from the discharge) and size of a water draft for municipal demand (З) (0,76 cubic kilometers or 1,37% from the discharge). Comparison of these characteristics for the long and short periods of record is impossible.

Total reservoir losses of water during 1956-1967 in annual aspect (52, 92 cubic kilometers) are less than for longer period (55, 38 cubic kilometers). This is first of all connected with allowance for new components (Ф, Ш, З). If not to consider these components water losses for the long period will be also higher (54, 03 cubic kilometers), than for the short period (52, 92 cubic kilometers). Comparing input and discharge parts of water balance of a reservoir for short and longer periods of record it will be observed the following:

size of inflow in a reservoir for a short period (55,41 cubic kilometers) and for a long period (55,96 cubic kilometers) are sufficiently close (if to consider industrial discharge for the short period they will be almost identical);

size of water loss from a reservoir for the short period (52,92 cubic kilometers) and for the long period (55,38 cubic kilometers) are different.

Annual sizes of input and discharge parts of water balance for the long period are sufficiently close (55, 96 cubic kilometers and 55, 38 cubic kilometers), for the short period they are essentially different (55, 41 cubic kilometers and 52, 92 cubic kilometers).

Above mentioned differences are first of all connected with allowance of new components of balance for a long period ($П_с$, З, Ш, Ф) and also with more precise determination of size water evacuation through tailrace structure.

The conclusions

Research of water balance components of the Kama Reservoir (1956-1993) has conclusions:

1) the basic components input parts of the Kama Reservoir balance is a reservoir inflow from the Kama River (53,18% in annual aspect), lateral inflow – 43,03%, meteorological precipitation from reservoir surface – 1,66%, industrial discharge – 1,29%, water from emerged ice and from emerged snow – 0,84%.

2) the basic components of water-resources output: water evacuation through the Kama hydroelectric power station turbine– 95,31%, evaporation from a reservoir surface– 1,43%, a water draft for municipal demand – 1,37%, a water filtration through a dam – 0,92%, stranded ice losses– 0,83%, lockage losses – 0,14%.

Comparison of components input part sizes and discharge parts sizes for short (1956-1967) and longer period has shown that on the Kama Reservoir inflow from the Kama River has increased from 29,44 cubic kilometers to 29,76 cubic kilometers, lateral inflow has decreased from 24,56 cubic kilometers to 24,08 cubic kilometers). The amount of precipitation has not changed, water from emerged ice has decreased from 0,50 cubic kilometers to 0,47 cubic kilometers. Water evacuation through the Kama hydroelectric power station turbine has increased from 51,68 cubic kilometers to 52,78 cubic kilometers, evaporation from a reservoir surface has not changed, stranded ice losses are decreased from 0,51 cubic kilometers to 0,46 cubic kilometers.

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