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THE LEAD INTOXICATION AFTER – ACTIONS CORRECTION BY THE PECTIN PREPARATIONS

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The direct influence such xenobiotics, as the heavy metal salts, is one from the most active factors, having attacked and destroyed the intestines epithelium normal structure. All these agents are being provoked the defects appearance in the mucous overlays and in the glycocalyx, having promoted the large protein molecules and the toxic substances entering into the blood [1].

The lead metabolism in the intestinal epithelial cell, may be, to be presented in the following way. So, the metal complex with the protein is being penetrated through the basilar membrane into the proper mucous plate of the small intestines and further into the blood capillaries and the blood channels [2]. Then, the blood, having contained the metal and having flowed from the small intestines, is being entered into the portal vein and further into the liver. The lead is partially being metabolized, and it is being formed the complex compounds with the bile and the taurocholic acids in the liver hepatocytes. So, in this form, it is being isolated into the small intestines lumen with the bile current. So, the metal part is usually being taken away with the faeces, but another part is being soaked through and it is being absorbed into once more, having provided, ipso facto, the hepato – enteric recirculation [3].

The contemporary biological means of the lead intoxication inhibition, as a rule, are being directed not only at the key

metabolic imbalances correction, but and at the lead retention lowering in the human organism [4]. At present, the vegetable origin entero-sorbates are the most perspective for the systematic application, at the aims of the lead intoxication bio-prophylaxis, among which the pectins are being belonged to their special place. The pectins' significant quality and their characteristic are being consisted in that they are much stable to the amylases action and the other ferments, and, that is why, they are not being soaked through, and they are not being absorbed into the small intestines. This kind of their quality and the characteristic are provided their peculiar physiological action – the ability to be bonded and to be taken the heavy metals from the human organism. Also, the pectin is quite able to be formed the gel on the stomach and the intestines mucous coat, and owing to this, to have the coating and the protective effect, having protected the mucous membranes from the aggressive factors stimulating and the irritating action [5].

The work's **target** has been the pectin action study and the examination upon the rat's small intestines epithelium morphological structure under the lead intoxication conditions.

The Materials and the Researches Methods

The study and the research have been carried out at the white non-pedigreed rats, which are the males, having had their 180-200 gr. mass. All these

animals have been divided into 3 main groups: the 1-st one – the control one, where the animals ration has been made up from the grain, the seeds and the water; the 2-nd one – the rats have been got the lead acetate solution (e.g. 100 mg/kg), besides the conventional feeding by the grain and the seeds during the 168 hours, the 336 hours, and the 504 hours; the 3-rd one – the rats have been got the sugar beet pectin water solution with the etherification degree $43,15 \pm 0,01$ (e.g. 100 mg/kg) also during the 168 hours, the 336 hours, and the 504 hours, after the corresponding grain, the seeds, and the lead feeding term. All kinds of the manipulations with the animals have been carried out in the full accordance with the MPH of the USSR order «On the Humane Treatment with the Experimental Animals» №755, dated from July, 12, 1977; in the accordance with «The Works Carrying out Rules with the Experimental Animals Application» (e.g. the Higher Education Institution Ministry order, dated from November, 13, 1984, №724) and «The Rules, Having Accepted by the European Convention on the Backboned Animals Protection» (e.g. Strasbourg, 1986). The small section intestines areas have been served the special material for the research and the examination. The rats' small section intestines fragments have been fixed in the 10% formalin solution, having prepared on the phosphate buffer (e.g. pH 7,2–7,4), they have been dehydrated in the increasing concentration alcohols, and they have been embedded in the paraffin for the histological study and the examination. Then, the sections, having the 5-7 mkm thickness on the sled microtome, have been prepared. The staining has been made by the hematoxylin and by the eosin. The microslides have been looked through in the light microscope (e.g. «Topic-T»),

as the low – power (e.g. $10 \times 10 \times 1,25$), well as the high – power magnification (e.g. $10 \times 40 \times 1,25$) have been used. Then, the necessary preparations photography has been made by the «CAMV200» digital camera (e.g. the «Vision», firm, Austria).

The Research Results and Their Discussion

The morphological changes in the small intestines tissues have already been revealed, in the result of the carried out researches and the studies. On the expiry of the week, the changes are being observed in the villi structure, under the lead influences. So, the overwhelming majority of them are being shortened, and the vacuoles are being seen in their epitheliums. So, the villi height and the crypt depth have been shortened along the whole length of the small intestines. And the micro-villi structure is being constantly changed: their quantity is being decreased per unit area that is affected upon the penetrability and the absorption processes. The goblet cells hypersecretion is noted that it is quite possible to be to be valued, as the protective reaction upon the injured agent influence, from the side of the epithelial cells. The mucous membrane is quite the loosened, the edematous, and the plethoric one. In the submucous layer separate places, the loosened connecting tissue is being quite atrophy, it is being destroyed in some areas, and it is being substituted by the unstructured homogeneous mass. So, it is quite well seen the myocytes bundles «dissociation» in the main mass.

The hemodynamic and the dystrophic changes degree has already been increased after the 312 hours at the intestinal wall research and the study after the metal influences. So, the expressed plethora and the marked hyperemia are being

prevailed; and against this background, the zones and the areas with the spasmodic and the constricted vessels are being alternated with the sharp dilatation zones and the areas of the circulatory system all its sections. In a number of the places, the loose connective tissue is being completely atrophied in the submucous layer, and it is being observed the vacuoles, the hollows, the cavities presence, having lined by the cells, like the endothelium. The oxyphilic fibers with the clear – cut direction along the walls have already been discovered in all these cavities walls. The villi deformation is being observed in the mucous membrane with the great constancy and its regularity. There is the mucous membrane epithelium with the hydropic indications and the vacuolar degeneration signs: it has been desquamated at the some areas, and the quite and the evident symptoms of the desquamation are not being observed.

The villi have their elongated form; the epithelial cells desquamation, its cytoplasm vesiculation, the cytoplasm separate necroses are being brightly expressed, on the expiry of the 504 hours of the toxic influence and their effects. The expressed and the marked perivascular edema are being observed in the submucous membrane: the sharp-expressed plethora and the sharp-marked hyperemia, the plasmo- and the erythrosthesis, the formed elements adhesion to the vascular wall (VW), the unit thrombi. All these morpho-structural changes, from the intestines side, are testified to on the heavy intestinal pathology development. The intestines epithelium structure changes are being observed, having researched and examined the microslides with the small intestines sections after the pectin influence during the 162, 336, and 508 hours.

The villi are the short, and the wide ones, the regeneration processes are being

observed, and these villi height is quite different, just after the 168 hours. The hydropic and the vacuolar dystrophy are distinctly expressed. The goblet cells active secretion is being marked at many sites and the zones, much villi are being surrounded by the gel – like substance, probably, having formed by the pectin fibers. The cavities quantity and their sizes are being decreased, and the loose connective tissue is quite near to the normal state in the submucous layer.

So, the sharp changes are not being observed at the small intestines study and the examination after the pectin influence 312 hours. However, the villi structure, their height, and the width have been restored, but, nevertheless, the hydropic and the vacuolar dystrophy is being preserved.

The villi are as the long, well as the thin ones after the pectin influence during the 504 hours, and the small intestines mucous membrane structure is not quite distinguished from the mucous one state. The hydropic and the vacuolar dystrophy is quite absent in the villi epithelium, but it has been preserved in the glands epithelium. So, the loose connective tissue is being corresponded to the normal state in and around the villi.

Thus, the rat's small intestines morpho-structural state histological analysis has been shown, that the pectin substances application, for the purpose of the lead intoxication bio-prophylaxis, is quite the reasonable one. The manifestation degree and the positive dynamics character is constantly being increased with the given enterosorbates application prolongation rise.

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HYPOTHESIS ABOUT ROLE OF PURINES IN THE DEVELOPMENT OF RENAL DISEASE ASSOCIATED WITH ARTERIAL HYPERTENSION

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The concentrations of intermediates of purine metabolism in blood at patients glomerulopathy and tubulopathy associated with arterial hypertension were tested. At patients with chronic glomerulonephritis and chronic tubulointerstitial nephritis two stable trends of purine metabolites concentrations were observed (normal and very high). Hypertensive patients also were recorded two stable trends of purine metabolites concentrations, but in opposite direction (normal and reduced). The hypothesis of adenosine reduction in the mechanism of renal disease in hypertension was discussed. Excessive accumulation of purine nucleotides in blood at patients glomerulopathy and tubulopathy was supposed to take part in promotion of the progression of chronic renal diseases.

Keywords: purine metabolism, chronic diseases of kidneys, arterial hypertension

One of the promising directions in biomedical research is the study of intermediates of purine metabolism. It is determined their diverse metabolic functions, including its participation in the regulation of renal function, vascular tone, coagulation, etc.

The aim of our study was to examine the content of intermediates of purine metabolism in patients' blood with glomerulopathy and tubulopathy associated with arterial hypertension.

Patients and methods

The groups of patients with chronic glomerulonephritis (GN) and chronic tubulointerstitial nephritis (IN) were formed. In addition, the patients with arterial hypertension (AH) without renal pathology also tested. A separate group comprised patients with a combination of AH and IN (AH + IN). The diagnosis were based on a complex survey, which included standard methods of patients examination. In some cases, morphological verification of renal

pathology carried out. It was estimated the glomerular filtration rate, which all patients reached normal values. Hypertension did not exceed the second degree level. The content of intermediates of purine metabolism (guanine (G), hypoxanthine (HXn), adenine (A), xanthine (Xn) and uric acid (UA) was determined in the blood plasma of patients of investigated groups. Metabolites of purine metabolism were studied by the method of E.V. Oreshnikov and collaborators [1]. The concentration of purine bases was expressed in units of extinction (un.ekst.). Statistical analysis of the data was performed using STATISTICA software package version 7.0, a version recommended for biology and medicine.

Results

Analysis of changes of purine metabolism indicators at patients with GN and IN revealed two trends, and on this basis two clusters were formed (Table 1).

Table 1

Content of purine metabolites in blood plasma of patients with glomerulonephritis and interstitial nephritis ($M + m$)

Indicator	Control ($n = 25$) (The reference values)	GN cluster 1 ($n = 25$)	GN cluster 2 ($n = 13$)	IN cluster 1 ($n = 11$)	IN cluster 2 ($n = 6$)
Guanine	$146,85 \pm 8,4$ 130–260	$616,5 \pm 106,2^*$	$245,6 \pm 89,9$	$628,0 \pm 74,3^*$	$184,5 \pm 74,3$
Hypoxanthine	$164,71 \pm 27,06$ 110–224	$548,5 \pm 97,4^*$	$209,6 \pm 77,87$	$594,0 \pm 70,67^*$	$155,0 \pm 70,67$
Adenine	$122,86 \pm 19,33$ 90–180	$453,2 \pm 114,2^*$	$167,4 \pm 64,12$	$563,0 \pm 56,17^*$	$124,0 \pm 56,17$
Xanthine	$142,93 \pm 23,39$ 90–190	$478,7 \pm 122,7^*$	$213,1 \pm 68,4$	$586,0 \pm 61,5^*$	$174,0 \pm 61,5$
Uric acid	$286,57 \pm 28,35$ 213–372	$439,9 \pm 128,8^*$	$233,6 \pm 69,2$	$572,5 \pm 72,9^*$	$198,5 \pm 72,9$

Note: * – accuracy compared with the control group $p < 0,05$.

As can be seen from Table 1, the content of all the intermediates of purine metabolism in patients with GN of 1 cluster is much higher than the upper limit of the physiological norm in patients with GN, combined in a second cluster. The content of guanine, hypoxanthine and adenine was nearing the upper limit of the physiological norm in GN patients, combined in the 2 cluster. The only exception was xanthine, which level was higher than control. A similar trend is observed for IN patients. Two trends was also showed on analysis of changes of purine indicators in patients with AH and AH+ IN; and on this basis it was formed two clusters (Table 2).

The content of intermediates of purine metabolism is no excessive of the physiological norm in blood plasma at patients with AH combined in the 1 cluster. It was fixed the decrease of guanine, hypoxanthine, adenine and uric acid content relatively the upper limit of the physiological

norm in blood plasma at patients with AH united in the 2 cluster.

The intensive decrease of intermediates which were accuracy higher of the physiological norm was fixed in blood plasma at patients with AH + IN united in the 1 cluster. In the blood plasma of patients with AH + IN combined in a second cluster, was fixed a sharp increase of intermediates, which significantly were exceeded those of the physiological norm.

Discussion

Consequently, we have the opposite changes the content of metabolites of purine metabolism. In patients with GN and IN, and AH + IN was revealed two stable trend: the fluctuations in the concentration of purine metabolites within the physiological norm, and a sharp increase in the concentration of some metabolites in plasma. Increasing the concentration of

adenine in plasma of patients with chronic renal failure on hemodialysis, and patients with renal transplant has been shown previously Slominska EM et al [2]. Hypertensive patients also was recorded two stable trend, but with a different direction. The

first trend was the changes of the studied metabolites concentration in the range of physiological norm. The second trend was reducing the concentration of different metabolites in blood plasma lower than the control data.

Table 2

Content of purine metabolites in blood plasma of patients with AH and AH+ IN (M + m)

Indicators	Control (<i>n</i> = 25) (The reference values)	AH cluster 1 (<i>n</i> = 18)	AH cluster 2 (<i>n</i> = 7)	AH + IN cluster 1 (<i>n</i> = 7)	AH + IN cluster 2 (<i>n</i> = 20)
Guanine	146,85 ± 8,4 130–260	222,6 ± 43,51	122,0 ± 33,8	505,1 ± 74,96*	170,9 ± 62,46
Hypoxanthine	164,71 ± 27,06 110–224	188,2 ± 42,5	98,6 ± 26,91	459,7 ± 69,37*	143,0 ± 56,13
Adenine	122,86 ± 19,33 90–180	147,4 ± 35,98	76,6 ± 22,7*	408,9 ± 97,86*	114,8 ± 49,11
Xanthine	142,93 ± 23,39 90–190	199,7 ± 36,6	114,1 ± 34,7	450,6 ± 91,16*	157,8 ± 60,94
Uric acid	286,57 ± 28,35 213–372	233,3 ± 62,9	137,3 ± 42,4*	402,4 ± 24,62*	189,0 ± 75,93

Note: * – accuracy compared with the control group $p < 0,05$.

In order to pathogenetic interpretation of the detected phenomenon, we propose the following working hypothesis. The increase of catabolic content of purine metabolism can be due to breakage of their capture and transport to the cells, or due to increase their emergency (for example, the destruction of cells). Purine nucleotides accumulate in the extracellular environment in response to metabolic stress and cellular damage, in particular, during hypoxia, ischemia and inflammation. The general sources of adenosine are neutrophils, endothelial cells and microphages [3, 4]. Increasing concentrations of purine bases has an ambiguous effect

on metabolic processes in the organisms of patients. For example, guanosine has protectional effect against apoptosis of tubules and renal dysfunction. This effect is manifested in the activation of small GTP-ase involved in the function of the cytoskeleton and intracellular transport. Likely, another mechanism as stimulation of the synthesis of nucleic acids also can be used [5, 6].

Extracellular adenosine causes a cascade of cellular and tissue responses, which are considered as defensive, to maintaining homeostasis [6]. At the same time, adenosine demonstrates a variety of detrimental properties as induction of cy-

tokine synthesis and modulation function of neutrophils and formation of active oxygen agents [7, 8]. Extracellular adenosine is considered as important mediator of renal function [9, 10] and it influences on regulation of renine secretion. In turn, the dysfunction of the renin-angiotensinogen-angiotensin relationship determines the development of prothrombotic state [11]. Finally, adenosine promotes the initiation of procoagulant phase, induces platelet activation, and it has a vasoconstriction effect [12]. Xanthine and hypoxanthine induce vasoconstriction and damage of the endothelial barrier [13, 14].

Consequently, the excess accumulation of purine nucleotides can be regarded as an independent pathogenic factor of blood cells damage, the development of procoagulant phase, endothelial damage, disruption of metabolic processes in the kidneys, which can be regarded as a condition for the progression of chronic kidney disease (CKD). Currently it was proposed to consider two groups of mechanisms of CKD: nonmodified and modified. The first group includes factors such as age, sex, genetic factors, etc. The second group includes the bases disease activity, hypertension, metabolic disorders and hemocoagulation [15]. Imbalance of purine nucleotides should be considered as a new metabolic «agent of influence», as factor which determines the mechanisms of development and progression of chronic kidney disease. Hypertensive patients observed a decrease of some metabolites content of purine metabolism in blood plasma lower the reference data. In our opinion, this is a key moment determining one of the mechanisms of renal disease in hypertension.

According to modern concepts extracellular adenosine regards the strong regulatory effect on renal function. Thus, in particular, it was shows the role of adenosine in enhancing the glo-

merular filtration rate in hypoxic conditions [16]. Extracellular adenosine inhibits the activity of matrix metalloproteinase, which are now considered as one of the leading factors of the renal disease formation [17].

As mentioned earlier, in some hypertensive patients was fixed decrease concentration of adenine and uric acid in blood plasma below the physiological norm. Reducing the number of adenine in blood plasma may be due to several mechanisms: a decrease in its formation of nucleotides, increasing the capture cells, recycling through the catabolism or excretion, etc. As previously in all patients with hypertension documented increase of acid-soluble precursors of nucleic acids [18], which are subsequently catabolised to nucleosidmonophosphats, then we can talk about reducing the rate of formation of nucleosides from nucleotides. As already mentioned, our data demonstrate a decrease of extracellular adenosine in the blood of some patients with hypertension. Decrease in the concentration of extracellular adenosine against hypoxic renal tissue (eg, due to increase of blood pressure and compensatory vasoconstriction of glomerular arterioles) reduces GFR, which, in turn, may be one of the triggers of an inflammatory or toxic lesions of the kidneys. Low concentrations of adenosine and other purine catabolites in plasma under rules supported by a system of enzymes that are present both in soluble form and localized to the membranes [16]. Such systems are characterized by strong polymorphism. Therefore, the change of adenosine and purine catabolites in blood plasma of patients with hypertension is determined by individual characteristics of active components of these enzyme systems, catalyzing the formation and further damage. This explains the development of kidney lesions in some patients with arterial hypertension.

Thus, we propose a new predictor of renal disease in hypertension: reduction of adenosine. Excessive accumulation of purine nucleotides can also be regarded as an independent pathogenic factor determines blood cells damage, the development of procoagulant phase, endothelial damage, disruption of metabolic processes in the kidney that promotes the progression of chronic renal diseases.

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Materials of Conferences

**PHYSIOLOGICAL PARAMETERS
OF EXTERNAL RESPIRATION
IN SPORTSMEN WITH DISEASES
OF MUSCULOSKELETAL SYSTEM**

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Nowadays, much importance is being attached to the functional condition of the ventilation system of sportsmen, which is a factor reflecting body's physical characteristics and its ability for prolonged intensive muscle activity. The interest is determined by the fact that high training loads can cause additional pathologic changes in the organisms of unprepared disabled sportsmen.

The aim of the research was to study how powerlifting influences some of the characteristics of the respiratory system in disabled sportsmen with diseases of musculoskeletal system (DMS).

To analyze the external respiration parameters, we used diagnostic spiroanalyzer Spirolab MIR III with the SpO₂ function (Italy). The breathing capacity (BC), inspiratory and expiratory reserve volumes (IRV, ERV) have been measured.

21 disabled sportsmen, aged between 17 and 25, took part in the observation. The research participants had the following sport rankings: I sport category (5), sub-master sportsmen /SMS/ (6), master sportsmen /MS/ (9), master of sport of international level /MSIL/ (1).

Our control group included 27 apparently healthy people of the same age, who did not do sports.

The comparing parameters of the static lung volumes in both groups has revealed that the BC of the disabled sportsmen was 18% higher than in the control group (reliability $p < 0,05$).

Inspiratory and expiratory reserve volumes of sportsmen with DMS, who did powerlifting workouts, differed from those of the control group. For instance, ETV of non-sportsmen was several times higher than that of the disabled sportsmen: $1315 \pm 3,8$ ml and $1190 \pm 6,3$ ml correspondingly (though these figures did not exceed the average statistic physiologic values). As for the IRV, the disabled sportsmen proved to have higher values than the apparently healthy persons ($1867 \pm 5,3$; $1613 \pm 8,2$; $p < 0,05$).

Upon the obtained data, we came to a conclusion that there is a certain trend in character-

istics of the ventilation system in sportsmen with DMS, connected with their professional activity.

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**THE TEENAGERS OBESITY
COMPLEX MULTIFACTORIAL
REHABILITATION IN COMBINATION
WITH THE ARTERIAL HYPERTENSION**

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The carbohydrate, the lipid, and also the other metabolism types' disorders complex combination diagnostics challenges are being caused the great scientific and the considerable practical interest, and their role discussion in the chronic diseases pathogenesis of the internal organs in the last and the recent years.

In this connection, the epidemiological researches and the studies currency is quite understandable, with the purpose of the earliest detection and its diagnosis of the risk factors, and the prophylactic arrangements commencement. For all this, it is quite necessary to be taken into consideration and such fact, that the arterial hypertension (AH), the overweight (ORW) human body, the lipid spectrum violation are often being passed against the background of the exo – and the endogenous intoxications [1, 3].

Thus, the main challenge is being confronted before the human organism – the normal homeostasis preservation, and also its optimization [2], at the endogenous intoxication. By V.M. Dilman expression, «the law deviation of the homeostasis» is being begun to be worked.

Thus, the work's target has been the complex endo-ecological rehabilitation influence study and the examination upon the risk factors of the chronic non – infectious diseases.

The Material and the Method

The complex rehabilitation program has been consisted in the following approaches: the

individual diagnostics, the basic teaching program, the video – and the printing information; the life style correction, the human organism cleaning and the purification, the human body mass normalization and the ABP, the entero-sorption, the bio-stimulation, and also the anti-oxidant therapeutics carrying out, the medicinal starvation and the therapeutic fasting, the hypo-caloric diet, and the medicinal herbs, the massage, the manual and the music therapy application. The complete medical treatment course has been continued 456 hours.

So, the 43 patients with quite different obesity severity degree, in the combination with the arterial hypertension (AH) have already been examined: the male youngsters – 28, and the female youngsters – 15. Then, the Quetelet index has been calculated, in order to be evaluated the human body fat mass accumulation degree, as the human

body mass correlation, having expressed in the kilograms to his height, which is being expressed in the metres, having squared, that is the Quetelet index = $MT (kg) : the Height (m^2)$.

The obesity abdominal type has been stated by the waist measurements (WM) correlation size to the thighs volume (TV). It is less 0,95 at the male youngsters, and it is less 0,80 at the female youngsters in the standard.

The arterial pressure (AP) has been measured by the Korotkov method, whereupon the average arterial pressure has been calculated by the following formula: $AP_{av} = (AP_s + 2 AP_d)/3$ [mm Hg], where the AP_s – the arterial pressure systolic mm Hg., the AP_d – the arterial pressure diastolic mm Hg.

The Leukocytic Index of Intoxication (LII) is usually being calculated by the Ya.Ya. Kalf – Kalifa formula:

$$LII = (4MI + 3U + 2P + C) \times (PL + 1) / (L + MOH) \times (\Sigma = 1),$$

and the Intoxication Index (II) – by the neutrophils to the lymphocytes correlation (e.g. at the healthy ones up to 1,5). The lipoproteids fractions: LDL, VLDL, HDL [1] have been researched at all the examined ones. The 30 people have been made up the control group.

The obtained results have statistically been processed, by means of the t Student criterion.

The Results and Discussion

The examined females youngsters have got the highest Intoxication Index (II) from 2,06 up to 3,7 at the physiological oscillation up to 1,5; LII – 1,8 (e.g. at the healthy ones up to 1,0) in the pre-rehabilitation period [4].

So, the highest II has already been registered from 2,09 up to 4,0 at all the male youngsters, having entered into the rehabilitation group. Then, the abdominal obesity has been taken its place at the 54% male youngsters and the 45% female youngsters.

Thus, the initial high II at the male and the female youngsters with the abdominal obesity in the examined group is the main criterion, having reflected the adaptive systems violation, having needed the direct monitoring, at the endo-ecological rehabilitation carrying out.

So, the most informative ones have been: the human body mass increase (e.g. 100%), the arterial hypertension (AH) (e.g. 80%), the memory impairment (e.g. 64%), the general weakness (e.g. 85%), the dyspnea or the short breath (e.g. 36%), the headache (e.g. 66%), the sleep disturbance (e.g. 65%), the intestinal malfunction (e.g. 58%), and 40% pa-

tients have registered the dysorexia at themselves at the 15 per cent from the number of the examined ones, at the clinical indicators analysis.

All the given indicators will have to be taken into account, at the persons with the human body overweight mass, in combination with the arterial hypertension (AH), during the complex endo-ecological rehabilitation carrying out. All the same indicators are quite to be served, as the efficiency criteria of the carried out arrangements.

So, the LDL, VLDL, HDL have been within the limits of the physiological oscillations in the female youngsters group, in comparison with the control one, and they have been made up $0,83 \pm 0,07$ mmol/l (e.g. $P > 0,05$), $1,4 \pm 0,02$ mmol/l (e.g. $P > 0,05$), $0,57 \pm 0,02$ mmol/l (e.g. $P > 0,05$), correspondingly.

The changes in the lipid spectrum with the LDL, VLDL, HDL insignificant increase up to $2,13 \pm 0,07$ mmol/l (e.g. $P > 0,05$); $1,86 \pm 0,017$ mmol/l (e.g. $P > 0,05$); $0,77 \pm 0,02$ mmol/l (e.g. $P > 0,05$), correspondingly, have already been revealed at the male youngsters.

The II has been down to 2,0 (e.g. for 24,5%, $P < 0,001$), as a result of the rehabilitation complex program.

So, the dynamical observation for the human body change in the mass had been shown, that it appeared the decrease was equal to 8,4 kg (e.g. 10,3%, $P < 0,01$) or 0,45 kg/day for the whole medical treatment course, in average.

Then, it has been noted, the patients' considerable quality life improvement, and also the

complaints number decrease for the 87%, as a result of the complex non-medicamental and the non-pharmacological program application.

And the arterial pressure complete normalization has been noted at all the male and the female youngsters.

Thus, the rehabilitation arrangements complex with the diet calorie content restriction is being accompanied by the endo-toxicosis degree decrease, by the complaints number decrease, by the life quality improvement, and also by the hemodynamic parameters normalization. So, the risk absence for the patient's health is being dictated the possibility to be recommended the rehabilitation complex for the wide – scale introduction and the further realization into the public health practice.

The Resumes

1. The human body overweight mass (HBOM) presence, AH, the II increased, and also the lipid spectrum violations are the most convincing criteria for the complex endo-ecological rehabilitation carrying out.

2. The complex rehabilitation program with the hypo-high-calorie diet is the quite enough efficient approach for the multifactorial prophylaxis carrying out of the chronic non-infectious diseases.

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LYMPHOID OR HAEMOPOIETIC ORGANS?

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More century bone marrow was considered as part of bones, spleen was classified to alimentary system, thymus – to endocrine glands, lymph nodes – to lymphatic system. The first International Histological Nomenclature contained division «Haemopoietic organs» – bone marrows, spleen, thymus. In new International Anatomical and Histological Terminologies all seats of haemopoiesis are united into lymphoid system by their immunopoietic function. This aggregate can be to definite only as lymphoid apparatus. Bone marrow, aggregated and solitary lymphoid nodules are not independent organs. Red bone marrow and spleen are mixed haemopoietic organs by their structure with predominance of myeloid tissue, which form in connection with venous sinuses. Thymus and tonsils arise as congestion of epithelial and mesenchymal cells, later they transformate into lymphoepithelial organs. Lymph nodes arise as interweavings of lymphatic and blood vessels by means of invagination of blood vessels into the lymphatics, connective tissue between them transformates into lymphoid tissue. I think that it should be to discern «haemopoietic organs», which are divided on myeloid-lymphoid (bone marrow, spleen) and lymphoid (thymus, lymph nodes, tonsils). Myeloid-lymphoid organs have row of important structural features – extralymphatic (parenchyma don't connects with lymphatic bed, it is related to thymus and tonsils too), sinusoidal (venous sinuses as paths away of blood cells), periarterial (by localization of lymphoid elements). Lymphoid organs contain high endothelium venules – paths of lymphocytes recirculation between primary and secondary lymphoid organs. Cortex of thymus looks like spleen on paths of lymphocytes influx in the organ.

LOCAL INHIBITION OF BLOOD FLOW AS PRE-CONDITION OF FORMATION OF HAEMOPOIETIC SEAT

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Mechanic of anlage of haemopoietic organs is not described in literature. Anlage of lymph nodes takes place when blood vessels with their

more thick walls invaginate into increasing lumen of embryonic lymphatic collectors together with their endothelial wall. Intervascular connective tissue of invagination accumulates lymphocytes gradually. Increasing invagination twists and narrows the lumen of matrical lymphatic vessel, which is divided on three segments – afferent, efferent and intermediate (primary marginal sinus of anlage of lymph node). The invagination takes place on path of lymph flow and slow down it with division on two flows: direct lymph flow skirts the stromal anlage of lymph node into lengthening primary marginal sinus and undirect, transfussional lymph flow penetrates the stromal anlage of lymph node where probably fragments of degenerating cells, tissues and organs settle including the partitions of lymphatic sacs and trunks. The fragments can induce migration of blood cells from blood microvessels of the invagination into its connective tissue, the stromal anlage of lymph node with its cleaning (macrophages) and transformation into lymphoid anlage of lymph node. Haemopoiesis in the (embryonic) liver takes place about sinusoides which are appeared due to that hepatic trabeculae constrict and divide subintestinal vein or venae vitellinae and umbilicales. Haemopoiesis in the bones begins in foetuses of third month about venous sinuses which occur in this period. Intensive sedimentation of calcium in bones begins in foetuses of fourth month and red bone marrow becomes the centre of haemopoiesis in foetuses of fifth month. It is possible that walls of bones cavities limiting of dilatation of bone marrow and veins promote formation of sinusoides and entrance of blood cells into blood flow. Intensive proliferating epithelial anlagenes of thymus «wall up» blood microvessels. In embryos of 7-8 weeks the anlagenes «descend» from cervical region into thoracical cavity and find in solid surroundings of muscles, clavicles, ribs, sternum and heart. Such case limits outer growth of anlagenes of thymus, promotes their approach and junction, formation of blood thymus barrier. In this period mesenchyma of thymus is loosened and blood microvessels widen in connection with production of proteoglycans, blood and thymosin flow out are lightened that stimulates influx lymphocytes from blood into epithelial anlagenes of thymus. Anlage of spleen takes place in embryos of 5-6 weeks, in solid surroundings of intensive growing organs (liver, stomach, pancreas, mesonephros, gonada, kidney and suprarenal gland) – external cuff of spleen instead of compact fibrose capsule which forms in foetuses. And compact mesenchyma in anlage of spleen limits widening of protocapillaries which is uneven. In embryos of 7-8 weeks stroma of spleen is loosened, protocap-

illaries transformate into venous sinuses. Besides, venous congestion spring up in anlage of spleen in connection with its removing from hepatic portal vein, its roots and tributaries. They are «cut off» by means of muscular coat of stomach and compact epithelial anlage of pancreas. But even in foetuses of 9-10 weeks intraorganic veins of spleen persist endothelial walls and thickening of its extraorganic veins is very small. At last in embryos of 5-6 weeks turns of stomach about its lesser curvature are accompanied by twisting of dorsal mesogastrium, deformation and constriction of its blood vessels, inhibition of blood flow from spleen.

THE IMPORT CONTRACTS FINANCING BY THE COMMERCIAL BANKS ON SECURITIES OF THE EXPORT CREDIT AGENCIES

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The contemporary stage of the Russian banking sector and its industry development, and also the world's credit and financially integration processes activization, are constantly being made the special great and the high demands to the banking management, for the purpose of its activity results high – level efficiency provision, including the international bank transactions carrying out sphere.

The Russian management subjects' external economic relations development is being characterized by the trade export – import relations volumes rise dynamics. So, the Russian foreign – trade turnover volume has been raised up in 1,4 time, and it has been made up 1,203 bln. dollars, for the period of the 2008–2009-es. So, the import and the export growth rates have been made up 10–15 % for the quarter of the year that is being conditioned by the Russian various organizations international contracts number growth with the foreign partners and also by the Russian external economic relations development.

The efficient and the reliable instruments role of the international accounts and the settlements is quite being increased, and also the banks' role in their realization, under all these conditions. For all this, the commercial banks are being acted, as the mediators, the guarantors, and the subjects' calculations and the transactions in the Russian various organizations international trade realization with the foreign contractors.

The banks are becoming more increasingly difficult to be worked in the foreign trade financing field, in the connection of the liquidity crisis. So, the borrowed means, having received from abroad by the Russian various credit organizations, the credit institutions, and the lending agencies especially for this business further development, because of the capital markets world – wide crisis, are being become more increasingly difficult and much expensive to be attracted them. The margin rate, having installed on the credits by the foreign banks, which is being lent out to the Russian banks, has been increased for the 3–6 % annual one towards the end of the 2010 year, in comparison with the 2009 year. In the term of the foreign trade financing, it is being noted the special tendency to the corresponding subdivisions creation, having carried out **the trade financing operations**, not only in the big, but in the average banks, and also in the small banks, which are not being entered into the top – 100 the Russian financial Institutions. The big import contracts financing challenge has been more become considerable towards the end of the 2010 year.

In the connection with this, the importers are constantly bringing the increased and the keen demand for the economically financial schemes, which are much profitable for them. So, there is one from these variants – the credit drawing up on the securities of **the Export Credit Agencies**.

So, the special organizations are being existed in many well – developed countries, having helped the national producers and the manufactures to be sold their final production in abroad – the Export Credit Agencies (ECA). These are the authorized bodies, which are frequently the state financial Institutions, having extended the credits, the guarantees, or the insurance to the exporters. In the overwhelming majority cases, ECA are usually specialized in the goods deliveries, in the services, in the equipment to the countries with the developing economy.

The bank, having worked with the Export Credit Agencies, is being given the quite serious competitive advantages at the Russian market, because it has the quite real possibility to be issued the prolonged, the long – termed and the cheap, the low – interest credits for the industrial equipment import to the various enterprises.

The Organization of the Economic Cooperation and Development (OECD) members – countries Agencies are usually insured the export contracts, having financed by the credit with the repayment period, which is made up the two years (e.g. 24 months) and even more. So, afterwards, the OECD countries have signed the Agreement, in which the export cred-

its, having supported by the state, work is being regulated – the OECD Consensus. So, the main demands to the insured contracts have been formed and completely fixed, including in it.

Firstly, the credit, having declared to the insurance, is quite able to be made up not more, than 85 % of the contract value that is the contract conditions must be provided the 15-th per cent pre-payment.

Secondly, the credit and the per cents on it must be repaid by the equal portions and the parts with the intervals no more, than the six months period (e.g. a half of the year), where the first portion and the part will have to be paid in time, not having exceeded the six months period, since the credit repayment commencement. So, the ECA working schemes are quite able to be considerably differed. The credit is quite able to be extended to, in the form of the installment payment by the producer and the manufacturer themselves, on the ECA securities. So, the quite another scheme more and more is being used with the various Russian companies, in which, without fail, the Russian bank has been included in it. Then, the Russian importer – company is addressed to its bank for the contract financing organization. The Russian bank is checking the enterprise financial performance, the guarantee and the security offer levels, it is taking the borrower function upon itself from the Western bank on the ECA security, in its turn, having given the credit to the importer. The customer pays for not less 15 % of the equipment value from its own funds, and the financing Western bank opens the irrevocable letter of the credit (L/C) in favor of the exporter. After the letter of the credit (L/C) opening, the exporter is being given the payment by the contract, and the importer begins to be repaid the credit.

So, the scheme main details are quite able to be changed – for example, the big companies are quite able to be addressed directly for the credit to the Western banks. Or (usually – at the brief or the short – termed contacts) the exporter issues the trade credit to the importer, and the bank is only being guaranteed the obligations performance by the importer, whereas the ECA insures practically the whole deal.

Thus, the Russian importer main crediting stages with the ECA insurance coverage application are the following:

1. The import contract conclusion between the importer and the exporter. Then, the importer puts in the application for the letter of the credit (L/C) opening into the Russian bank (e.g. at the same time, the contract is being concluded for the letter of the credit (L/C) opening).

2. Preliminarily, the exporter and the first – class foreign bank are being addressed into the ECA for the export credit insurance.

3. The first – class foreign bank and the Russian bank are being concluded the Basic credit contract between themselves and also the Separate credit contract within its frameworks (e.g. having provided this contract financing).

4. The advance payment is being performed by the importer.

5. The ECA is being provided the guarantee.

6. The Russian bank is being issued the letter of the credit (L/C), in favor of the exporter. Then, the first – class foreign bank is being advised the letter of the credit (L/C) to the exporter.

7. The exporter is being produced the goods shipment.

8. The exporter is being provided all the necessary documents to the first – class foreign bank, having provided by the letter of the credit (L/C) conditions.

9. The first – class foreign bank is being checked all the necessary documents, and also it is being paid for them, in accordance with the letter of the credit (L/C) conditions (e.g. up to 85 % from the contract total amount).

10. The first – class foreign bank is being addressed the notice on the payment date and on the financing conditions, and also it is being addressed all the necessary documents by the letter of the credit (L/C) for the allocation them for the importer. Afterwards, the Russian bank is being received its obligations extinction delay before the first – class foreign bank up to the 84 months (e.g. the 7 years).

11. The importer is being received its obligations extinction delay before the Russian bank up to the 84 months (e.g. the 7 years).

So, the import financing scheme is the most attractive one for the Russian importers, as the discount interest rate by the external credit is considerably profitable, than the Russian interest rates by the rouble credits. The payments in the credit repayment for the complex, having needed the assembly, equipment are began to be enumerated and afterwards to be transferred, as a rule, only through the half of the year (e.g. 180 days), since its successful introduction into the exploitation: a number of all the necessary documents provision by the exporter provision is being served, as the letter of the credit (L/C) opening condition, among which, – there is the transfer act deed, which is usually made up just after the equipment assembly and its checking up. So, the payments by the credit are being performed by the equal portions and the equal parts once in the half of the year

(e.g. 180 days). It is meant, that the borrower has not to be paid for the equipment in advance: it is began to be worked, and the credit repayment is being produced partially or completely, and already for the impact account from the capital investments.

So, it is quite possible to be related to the Western financing advantages of the import contracts on the ECA securities, which are the following:

- the rates are below, than the crediting Russian market rates level;

- the credit repayment prolonged terms, the delay in the principal debt payment up to the 6 months (e.g. the 180 days);

- the debt part repayment possibility from the means, having formed, in the result of the project realization, at the expense of the borrowing prolonged term;

- the payments by the letter of the credit (L/C) with the means immediate reimbursement to the exporter, at the expense of the Western bank resources.

Thus, the import contracts financing, on the export agencies securities, has been given the wide – scale spread, owing to the fact, that it has been taken into the consideration all the sides interests, and also it is the convenient and the profitable one for all the participants of the export – import deal.

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FEATURES OF THE LOCAL IMMUNOINFLAMMATORY RESPONSE AFTER RADICAL MASTECTOMY

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Breast cancer ranked the first place in the structure of cancer pathology in women. The immediate postoperative complications of sur-

gical benefits arising from an average of 75% of cases, prolong the postoperative period, require a substantial voltage defenses, put off the dates of other components of comprehensive treatment, which adversely affects overall survival.

The levels of cytokines IL-2, IL-6, lactoferrin (LF), IL-8, AAB to AH ImDNA in blood and wound discharge has been determined in 52 patients before surgery, 1st and 7th postoperative day after radical mastectomy for investigation of the immunoinflammatory response. The study was performed using test systems produced by «Protein contour» Saint-Petersburg on the manufacturer's instructions. Results of enzyme linked immunosorbent assay were recorded on a vertical Multiskan photometer MSS 340 at a wavelength of 492 nm.

The study have been showed the significant increase in the concentrations of IL-2, IL-6, lactoferrin, and the trend toward increased levels of IL-8 and AAB to AH ImDNA in serum in the early postoperative days. The obtained data have been revealed the activation of destructive inflammatory process in women after radical mastectomy. The content in wound discharge IL-2 was significantly higher than its concentration in the blood serum in 4,25-fold, IL-6 in 4,7 times, IL-8 in 3,75 times and lactoferrin in 4,8 times. We concluded the greater severity of local manifestations destruktivno – immune – inflammatory process in women surveyed in the first day after surgery. Data correlation analysis have been revealed a relationship between IL-6 ($r = 0,63$; $p < 0,05$); IL-8 ($r = 0,45$; $p < 0,05$); AAB to AH ImDNA ($r = 0,48$; $p < 0,05$) in blood serum and lymph. It demonstrates the relationship of destructive – immune – inflammation at the systemic and local levels.

The reduction of biologically active substances with pro-inflammatory properties (IL-6, IL-8, LF) on the seventh day after surgery have been proved a significant decrease in activity of the emergence of local and systemic inflammation. The indirect sign of the activity of destructive inflammatory process is significantly higher concentrations of markers of cell destruction AAB to AH ImDNA in the serum of patients in 7 day after surgery.

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A STUDY OF CHROMATOLYSIS AFTER INJURY OF THE ACCESSORY NERVE IN RAT

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Injuries of many peripheral nerves are common during accidents and occasionally during surgical operations. As such, it is essential to investigate the changes that occur in the motor neuron somata of these nerves after such injuries. When the axon is cut (axotomy), the nerve cell body (soma) usually undergoes profound alterations in structure, metabolism, and physiological activity (*Grafstein, 1975*). Axotomy usually involves removal of a significant portion of the nerve cell volume, but most of the synthetic machinery of the cell, because it is localized in the soma, is left intact, and the defect produced in the surface membrane at the site of injury is small in relation to the total cell surface that remains (*Grafstein, 1975*). The Nissl granules are strikingly present in the large somata of motor neurons that supply skeletal muscle. For example, they are abundant in the motor neuron somata of ventral grey horn of the spinal cord. These granules are more obvious in large, highly active cells, such as spinal motor neurons (*Williams et al, 1989*). They are scattered throughout the neuronal soma and they extend into the dendrites (except in very thin dendrites) but are absent in the axon and axon hillock (*Junqueira et al, 1986*). The typical morphological changes in the cell body first recognized by *Nissl (1892)* include swelling of the cell and the apparent disappearance of basophilic material («Nissl substance») from the cytoplasm. The prominence of the latter phenomenon led to the general application of the term «chromatolysis» for the response to axotomy. However, it has become increasingly clear that the morphological manifestations of this response are different in different cells, and that chromatolysis itself is not invariably seen (*Romanes, 1941*). Hence the term «axon reaction», «retrograde reaction» or «cell body response» have come to be considered more appropriate to designate the whole range of alterations that may occur (*Grafstein, 1975*). The characteristics of these alterations have been considered in great detail by *Cragg (1970)* and *Lieberman (1971 and 1974)*. During chromatolysis, usually there is also a shift of the nucleus from its normal central location in the soma to the peripheral one, but away from the axon hillock. Chromatolysis sets in approximately one day after the injury of the axon and reaches its height within

about two weeks (*Greep, 1966*). In certain cases the cell may die but in majority of cases the process is reversible and the Nissl bodies reappear, the cell resumes its normal contour and the nucleus returns to its central position. However, it has become increasingly clear that the morphological manifestations of this response are different in different cells and that the chromatolysis itself is not invariably seen. As such, the terms, «axonal reaction», «retrograde reaction» or «cell body response» have been considered more appropriate to designate the whole range of alterations that may occur (*Grafstein, 1975*). The features of the response to axotomy that have been described above are seen to some degree in most neurons with axons that terminate outside the central nervous system. However, in some cases the reaction had been overlooked because it did not have the features of typical chromatolysis. *Romanes (1941)* produced injuries (crushing, cutting and violent rupture of the nerves) to median, ulnar, radial and musculocutaneous nerves in rabbit. He found that after a postoperative survival period of 7 to 21 days, none of the cells in the cervical region of spinal cord displayed the typical reaction which has been designated chromatolysis. He also found that some of the cells on the operated side showed an arrangement of Nissl substance which was not visible on the unoperated side, consisting of a grouping of the Nissl substance as a more homogenous ring around the centrally placed nucleus with a clearer zone of cytoplasm between this and the cell membrane; the Nissl substance was absent in the dendrites. However, *de Neef (1901)* found in the same animal (rabbit) that anything but violent rupture of the nerves, was ineffectual in producing chromatolysis. *Van Gehuchten (1900)*, *Bucy (1928)*, *Geist (1933)* and many others also did not find the classical reaction (chromatolysis) in the cell body of ventral grey horn neurons after peripheral nerve trauma. In spite of this chromatolysis is frequently used as an experimental method for determining localization in the spinal cord (*Romanes, 1946*).

Ten Sprague-Dawley rats (6 males, 4 females) were used in the study. Under general anaesthesia (30 mg per Kg Nembutal sodium, intraperitoneally) and aseptic conditions, the trunk of the right accessory nerve (before it supplies the sternocleidomastoid and trapezius muscles) was exposed in the neck and a portion removed to prevent re-union. After 21 to 28 days of post-operative survival, the animals were killed, their circulation flushed with normal saline and perfused with 10% formal-saline at a pressure of 120 mm Hg. After perfusion, the medulla oblongata and the 1st, 2nd, 3rd, 4th, 5th and 6th cervical segments of spinal

cord were removed by a dorsal approach, separated from each other, embedded in paraffin wax and their serial transverse sections cut at a thickness of 40 micrometers. The sections were mounted on slides and stained with thionine. On the operated (right) side, a varying number of neuron somata of the ventral grey horn showed certain retrograde changes (or cell body response). No retrograde changes were observed in the neuron somata on the left (control) side. The retrograde changes (cell body response) shown by these neuron somata were of the following two types:

a) Neuron somata with typical chromatolysis. These somata showed dispersion of Nissl bodies and loss of affinity for stain (thionine). The cell often appeared more round than usual apparently because of some swelling. They had peripheral (eccentric) nucleus. Their nucleoli were either central or eccentric. From 15,42 per cent to 30,21 per cent of somata with cell body response were found to show typical chromatolysis.

b) Neuron somata with retrograde changes (cell body response) but without a typical chromatolysis. In these somata, there was a grouping of the Nissl substance as a more homogenous ring around the centrally placed nucleus with a clearer zone of cytoplasm between this and the cell membrane. Nissl substance was absent in their dendrites. From 69,79 per cent to 84,58 per cent of somata with cell body response were found to be of this type.

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LOCALIZATION OF THE MOTOR NEURON SOMATA OF THE SPINAL PART OF ACCESSORY NERVE IN THE MEDULLA OBLONGATA OF A RAT – A NISSL STAINING STUDY

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The motor neuron somata of the spinal part of accessory nerve form a group of neuron somata called the spinal nucleus of accessory nerve (SNA,

hereafter). The SNA supplies two muscles of the neck, the sternocleidomastoid (SCM) and trapezius (TRAP). The SNA has been investigated in experimental animals by many workers using different techniques. (e.g. retrograde axonal transport of HRP by Ullah et al, 2007, and by Kitamura and Sakai, 1982; retrograde cobalt labeling by Matesz & Szekely, 1983; retrograde transport of fluorescent tracer by Clavenzani et al., 1994; retrograde degeneration technique by Ullah & Salman, 1986). The SNA has also been identified in human embryos by Pearson (1938) and in human cadavers by Routal and Pal (2000) but their works lack experimental support. There are many conflicting views regarding the longitudinal extent and topography of the SNA even in the same species. Flieger (1964) in sheep, Augustine and White (1986) in Japanese baboon, Ueyama et al. (1990) in monkey, Ullah and Salman (1986) in rabbit etc. have localized the SNA in the caudal part of medulla oblongata and upper cervical segments of spinal cord, whereas, Satomi et al. (1985) in cat, Jenny et al. (1988) in monkey, Clavenzani et al. (1994) in sheep etc. have localized the SNA in the upper cervical segments of spinal cord only.

There is also disagreement regarding the number of groups of neuron somata representing the SNA. Dubois and Foley (1936), Holomanova et al. (1972), Augustine & White (1986) etc. have found that the SNA is made of only one group of neuron somata. Flieger (1964), Clavenzani et al. (1994) etc. have found that the SNA is made of two groups of neuron somata, (dorsal and ventral groups). Liinamaa et al. (1997) have found three groups of motor neuron somata representing SNA.

Dubois and Foley (1936) in cat, Pearson (1938) in human embryo, Romanes (1941) in rabbit, Holomanova et al. (1972) in cat, Ruminska-Kowalska et al. (1976) in dog, Ullah and Salman (1986) in rabbit, Augustine and White (1986) in baboon, and Routal and Pal (2000) in human cadavers, reported only one group of neuron somata representing the SNA.

Flieger (1964), Flieger (1966), Flieger (1967, Clavenzani et al. (1994) have found two groups of neuron somata representing SNA.

Kitamura and Sakai (1982) in rat, Matesz and Szekely (1983) in rat and Liinamaa et al. (1997) in feline found three longitudinal cell columns representing the SNA. Kitamura and Sakai (1982) located the motor neuron somata of SCM and TRAP muscles by retrograde axonal transport of HRP method in rat.

Matesz and Szekely (1983) located the SNA in rat by cobalt labeling (using cobaltic lysine complex solution) and found three longitudi-

nal cell columns containing cobalt labeled neuron somata. They were (1) medial, (2) lateral, and (3) ventral. Their medial column began at the level of pyramidal decussation in medulla oblongata and terminated at C-2, their lateral column was found in the ventrolateral part of ventral grey horn and extended from C-2 to C-6, and according to them, their ventral column was not easily distinguished from the lateral column and was made of thin thread of neuron somata lying ventral to lateral column. Their ventral column also extended from C-2 to C-6.

After an injury of the peripheral nerve (e.g. accessory nerve in the present study) the typical morphological changes in the cell body first recognized by Nissl (1892) include swelling of the cell and the apparent disappearance of basophilic material («Nissl substance») from the cytoplasm. The prominence of the latter phenomenon led to the general application of the term «chromatolysis» for the response to axotomy. However, it has become increasingly clear that the morphological manifestations of this response are different in different cells, and that chromatolysis itself is not invariably seen (Romanes, 1941). Hence the term «axon reaction», «retrograde reaction» or «cell body response» have come to be considered more appropriate to designate the whole range of alterations that may occur (Grafstein, 1975). The characteristics of these alterations have been considered in great detail by Cragg (1970) and Lieberman (1971 and 1974). During chromatolysis, usually there is also a shift of the nucleus from its normal central location in the soma to the peripheral one, but away from the axon hillock. Chromatolysis sets in approximately one day after the injury of the axon and reaches its height within about two weeks (Greep, 1966). The features of the response to axotomy that have been described above are seen to some degree in most neurons with axons that terminate outside the central nervous system. However, in some cases the reaction had been overlooked because it did not have the features of typical chromatolysis. Romanes (1941) produced injuries (crushing, cutting and violent rupture of the nerves) to median, ulnar, radial and musculocutaneous nerves in rabbit. He found that after a postoperative survival period of 7 to 21 days, none of the cells in the cervical region of spinal cord displayed the typical reaction which has been designated chromatolysis. He also found that some of the cells on the operated side showed an arrangement of Nissl substance which was not visible on the unoperated side, consisting of a grouping of the Nissl substance as a more homogenous ring around the

centrally placed nucleus with a clearer zone of cytoplasm between this and the cell membrane; the Nissl substance was absent in the dendrites. However, *de Neef* (1901) found in the same animal (rabbit) that anything but violent rupture of the nerves, was ineffectual in producing chromatolysis. *Van Gehuchten* (1900), *Bucy* (1928), *Geist* (1933) and many others also did not find the classical reaction (chromatolysis) in the cell body of ventral grey horn neurons after peripheral nerve trauma. In spite of this chromatolysis is frequently used as an experimental method for determining localization in the spinal cord (*Romanes*, 1946).

Ten Sprague-Dawley rats (6 males, 4 females) were used in the study. Under general anaesthesia (30 mg per Kg Nembutal sodium solution, intraperitoneally) and aseptic conditions, the trunk of the right accessory nerve (before it supplies the SCM and TRAP muscles) was exposed in the neck and a portion removed to prevent re-union. After 21 to 28 days of post-operative survival, the animals were killed, their circulation flushed with normal saline and perfused with 10% formal-saline at a pressure of 120 mm Hg. After perfusion, the medulla oblongata was removed by a dorsal approach, embedded in paraffin wax and its serial transverse sections cut at a thickness of 40 micrometers. The sections were mounted on slides and stained with thionine. The sections were examined microscopically to identify the chromatolysed neuron somata and to compare the experimental right side with the control left side.

The chromatolysed neuron somata (representing the SNA) were found to form a small group of neuron somata located in the caudal part (caudal 0,9 to 1,2 mm) of medulla oblongata at a site immediately ventrolateral to the pyramidal fibres (that were passing dorsolaterally after their decussation).

There is disagreement among many investigators regarding the longitudinal extent of the SNA in various species of mammals. It has been located in the caudal part of medulla oblongata and upper cervical segments by *Flieger* (1964) in sheep, (1966) in horse, (1967) in cow, *Matesz* and *Szekely* (1983) in rat, *Ullah* and *Salman* (1986) in rabbit, *Augustine* and *White* (1986) in Savanna baboon, *Ueyama et al.* (1990) in Japanese monkey and *Routal* and *Pal* (2000) in human cadaver. The results of the present study are in agreement with the above investigators because in the present study also the SNA was found to be located in the caudal part of medulla oblongata.

Pearson (1938) in human embryo, *Romanes* (1941) in rabbit, *Holomanova et al.* (1972) in cat, *Ruminska-Kowalska et al.* (1976) in dog, *Kitamura* and *Sakai* (1982) in rat, *Satomi et al.* (1985) in cat, *Jenny et al.* (1988) in monkey, *Clavenzani et al.* (1994) in sheep, *Liinamaa et al.* (1997) in feline located the SNA only in the cervical segments of spinal cord and did not find it to extend above in the medulla oblongata. The results of present study in rat are in disagreement with them because in the present study the SNA was located in the medulla oblongata. The major disagreement with *Kitamura* and *Sakai* (1982) is the fact that in the present study the SNA was located in the caudal part of medulla oblongata but they did not find the SNA there.

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THE REGIONALISTICS LOGISTIC ASPECTS

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The both principally different and the various logistics development directions are being singled out: the enterprises group logistics, having united by the technological and the engineering – functionally indication (e.g. the corporative logistics) and also the territory logistics, in which the territorial education (e.g. the regional logistics) is being acted, as the main organizer and the logistic activity leading participant (e.g. the regional logistics). So, the regional logistics and the regionalistics notions are being correlated with each other.

Keywords: Mezolevel, logistics, region, regional logistics, regionalistics economic flows

As it is quite known, the logistics has already come into the economy, that it is no mere chance, having appeared and having found sufficiently the wide application, as in the military science and in its business, and some later on, well as in the mathematics. So, the reasons and the premises, and also the prerequisites whole number have already been conditioned by its application the necessity, the reasonability, and also the efficiency in the economy. Thus, on the whole, the logistics has been formed, as the multi-leveled phenomenon, analogically to the economy.

**The Contemporary Logistics
Multi-Level Character**

The logistic space stratification has been gone, in our opinion, by the both ways.

Firstly, very soon, the enterprises have been felt the negative influence of the «hostile», and the non – logistic environment, firmly stood on the logistic organization positions, having formed the macrologistic systems. This has been resulted in the tendency, at the beginning, to be involved the nearest, and further, by the possibility, all the partners by their business into the special logistic system, to be

widened all its boundaries, and also to be formed the logistic space around them. So, the enterprises and their the nearest partners by their business, jointly having participated in the data – flow processes organization, which are general and the common ones for them, and, having united the main efforts on the management by them, are quite able to be considered the first mezo-systems in the logistics. And the corporations' logistics has been formed in such a way, having based on the integrity technological and the engineering – functionally unity principle. Then, the logistic chains have been built, which, in their turn, gradually have been lengthened, having included all the new sections and the links, more completely having involved the material flows movement just from the appearance their origin up to their final consumer.

Secondly, the logistics have gradually been pierced through the whole management system, having transformed into the business method, the national economy organization, the economy special ideology, on the whole, having formed macro-logistic space, having roused at the separated business entities level. So, the first network structures have already been

given the quite real and the actual examples of the macro-logical systems realization. Then, the macro-logistics has been formed gradually the logistic systems development macro-level has been made up. Thus, the territorial principle has been acted more frequently by the participants' consolidation integrity basis into the macro-logistic systems.

The logistics development has been resulted in, as to the indications, and the characteristics diffusion strengthening at the macro- and the micro-levels junction, thus, having made up the both multi-leveled polarities. In the result of this, the logistic boundary, the medial sub-level – the mezo-logistics has already been singled out.

So, the mezo-logistics has not been confirmed yet, as in the theory, well as in the practice up to present time, as the independent, the logistics development full of the value. Some economists consider the logistics application field sufficient differentiation upon the macro- and the micro-levels [3. p.9]. However, the boundary, the inter-level logistic space, having singled out more and more distinctly, is being acquired its quite specific indications and the peculiar characteristics, having separated and having stood apart just into the independent field of the existence, and, having demanded the purposeful and the independent study.

At the same time, the logistics development levels division is quite being left the actual challenge. That is why, it is quite possible to be agreed with the Stakhanov V.N., and Shekhovtzev R.V. opinion, who, in their turn, practically, define the boundaries between the multi-level logistic systems, as «the rather conditional ones» [5, pp. 37–38]. For all this, the mezo- and the macro-levels the least are distinctly being differentiated at the present day.

The Mezo-Logistics: Characteristics Dual Nature

The mezo-level median position is being defined the mezo-logistics characteristics dual nature. So, it is quite able to be corresponded to it, as the enterprises group logistic system, well as the territorial education logistics (e.g. of the region, or of the regions group), well as the territorial and the space system.

So, it is quite reasonably to be related the data – flow processes management in the network structures just to the mezo-logistics (e.g. it is quite possibly, which are considerably separated territorially), and also the logistic systems functioning, having created by the enterprise with its direct partners by their business for the date – flow processes coordination, at the expense of this, the whole activity efficiency rise. A number of the scientists and the scholars connect the mezo-logistics separation, and also the mezo-logistic systems formation together with the economy corporatization process [2, pp. 53–56; 4, pp. 53–55]. And, in this case, moreover, the territorial affiliation indication has not got the defining value.

At the same time, in our opinion, and the data – flow processes management systems, having formed in the framework of the separate territories (e.g. the towns, the cities, and the regions) will be corresponded to the mezo-logistics. Such kind of these systems are being presented by themselves the complex structures, having included, as the internal, well as the external trade flows, having united by the whole organization unity and the targets integrity.

Thus, the logistics is being developed at the mezo-level in the both principally different and the various development directions: the enterprises group logistics, having united by the technological and the engineering – functionally

indications (e.g. the corporative one) and also the territory logistics, in which the territorial education is being acted, as the main organizer and the logistic activity leading participant.

So, the first direction has already been sufficiently proved theoretically, and it has been realized in the practice. The corporative mezo-logistic systems are successfully being functioned, in the form of the necessary network structures, having worked in the quite different and the various activity spheres: the industry, the trade, the public catering, and the general, personal services, and the domestic service.

The mezo-logistics development second direction (e.g. the territorial one), the regional logistics, almost has not been developed theoretically, and it is being faced much and the considerable difficulties in the practical application. So, as a rule, the priority preservation of the proper, the private interests, having entered into the subjects system, and their unity and the integrity absence is being prevented the mezo-logistic systems creation and their successful functioning just in the territorial aspect. The market relations essence itself is being supplied this kind of the challenge. The joining and the uniting forces and the necessary motivation will have to be sufficiently the powerful and the severe ones, that it is quite especially and problematically for the regional logistic systems, and it is inevitably needed the most active participation in their building and also the state structures and the bodies functioning.

The Regionalistics and Logistics

The logistics space aspect apportionment is being highlighted its defined and the specified generality with the regional economy, which is more known in the West, as the Regional Science (e.g. the Regionalistics) [1].

The Regional Science has been formed in the West, in the middle of the XX-th century. This synthetic direction has been called upon for to be studied the regions, as the integral systems. So, the economy, the geography, the sociology or the social science, the architecture, and the trade are quite able to be the study and the researches scientific field, – the study and the researches general multi-aspect object is being united them all – the region, all they are being acted this united whole summands.

Prokofyeva T.A. and Lopatkin O.M. have justly noted in «The Distributive and Transportly Systems Logistics: the Regional Aspect» [5, p. 44], having studied the regional science and the logistics interconnection, that these both sciences, as the regionalistics, well as the logistics have got the academic interdisciplinary and the intersectoral status, and they are being distinguished by the study and the research object multi-planning. So, these both sciences interconnection scheme has been presented in the Fig.1.

If the regions, non – dependently from the studied aspects, are the studies and the researches by the integrated object for the regionalistics, then the economic flows (e.g. the material, the informational, the financial, and the service ones) are being acted, as the integrator and the general multi-planning object of the studies and the researches, and also the influences in the logistics. For all this, their deepening study multi-formity aspects is being defined by the activity those spheres and the areas, in the framework of which all these flows are being existed (e.g. are being functioned).

Thus, the regional logistics is being formed on the regional economy, the economical geography, the sociology or the social science, the politology or the political science, the regional

marketing, the commodity research, the merchandising and also the other sci-

ences junction, having got the space aspects.

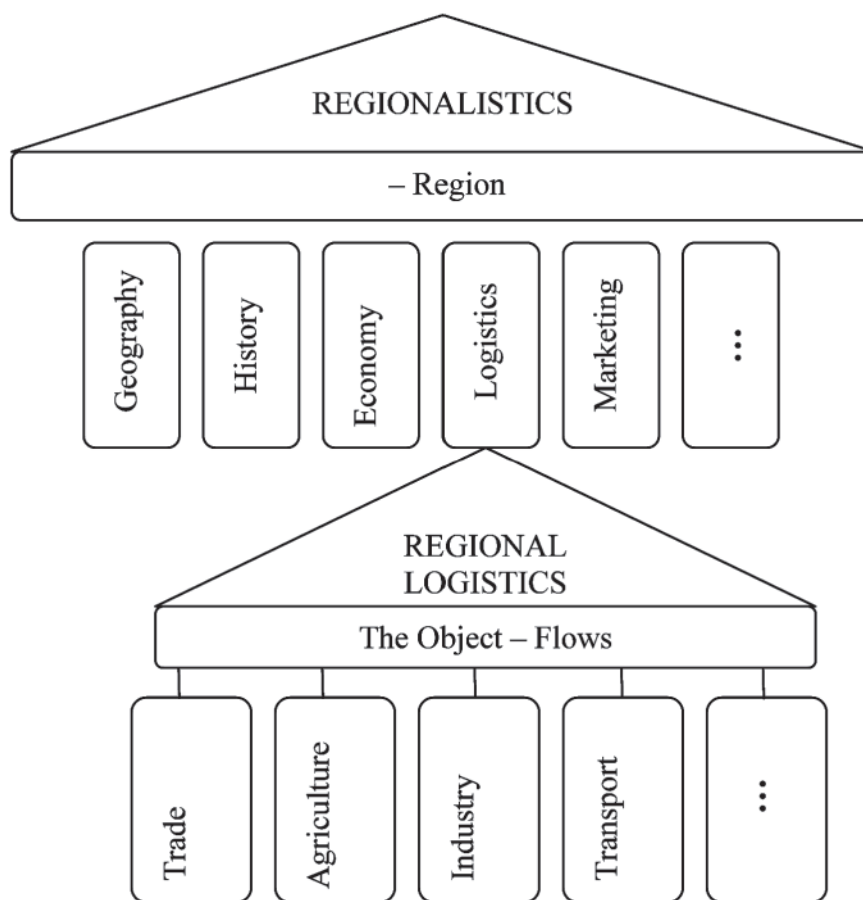


Fig.1. The Regional Science (e.g. Regionalistics) and the Logistics Interconnection Scheme

So, the regional logistics peculiarity and the special feature, as the regional science, on the whole, is its specific territorial direction and the research space aspect exclusive significance.

Accordingly, the characteristics and the peculiarities and the special features study of the every specific region, its place in the more general management system, and also the creating logistic systems and the subsystems space planning has already been become the most important and the most significant regional logistics element.

So, the economic flows logistic organization is being played the most active

role in the region's industry and the agriculture, the rural economy development, the commodity and the services regional market, in the employment provision and the population life social and the economic level rise, the region's natural and the other resources application improvement, in its economic and transport relations and the external economic activity improvement, in the region's whole economic system efficiency rise.

On the whole, the regional logistics is being directed upon the region economy development, by means the logistic infrastructure creation and its further improve-

ment and the perfection, and also the logistic subsystems formation.

Thus, today, the mezo-level is quite able to be considered, as the micro-systems rise and the development efficiency function, on the one hand, and the macro-systems various and the diverse type base unit formation, on the other hand. So, it is quite just and the true one and also for the regional logistics. The region's business entities more and more clearly are being needed just in the adequate logistic infrastructure, they are converging more actively to the logistic interaction establishment and the further development with each other. In its turn, the regions promote the macro-logistic systems in the states and the intergovernmental economic formations scales creation and the strengthening, having based their interaction on the logistic principles.

The resume

Having come into the economy, the logistics has gradually been formed the both realization levels, having distinguished by their subjective structure, by the mechanisms, and by the participants interaction character, and also by many other main parameters.

The mezo-logistics is being singled out, more and more clearly, which, owing to the force of its medial situation, possesses the dual characteristics, at the macro- and micro-levels junction. On the one hand, this is the enterprises group logistics (e.g. the corporative logistics), on the other hand, – the territories logistics (e.g. the regional logistics).

So, in the contemporary logistics, as the science, exactly, the regional logistics is being presented itself quite the least studied, the developed, and the realized field in the practice. That is why, it is being entered into the complex science – regionalistics by its component part.

If the regions are the study and the research single and the integrated object for the regionalistics, then for the logistics – these are the economic flows (e.g. the material, the informational, the financial, and also the service ones). The regional logistics is called upon for to be studied all these flows in the regional aspect (e.g. as the internal, well as the external ones, towards to the region).

In their turn, the economic flows are being formed quite in the different and the various activity spheres, having formed the multi-faceted and the diverse regional logistic subsystems. For all this, the existing multi-fomity and the diversity aspects of their deepened study and the examination are being defined by the region's economy system development their level and the structure.

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THE SHOSHONITIC GRANITOIDS OF ALTAI-SAJAN FOLDED AREA: PETROLOGY AND ORE MINERALIZATION

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In the paper presented data about shoshonitic granitoids Altai-Sajan folded area. Petrology of granitoids and link with them ore mineralization considered. Deposits of W, Mo, Ta, Nb, Au, Be, REE known in paragenesis and space link with shoshonitic granites.

Keywords: shoshonitic granitoids, ore mineralization, petrology, fluid regime

For the first time the shoshonitic type granitoids (SH) derived China's investigators in during study intrusive bodies N-W part of China (Jiang, Jiang et.al, 2002). The shoshonitic group of granitoids incorporate assemblages monzogabbro – monzodiorite – monzonite – quartz syenite, or monzonite granite – granite, or biotite (monzonite) granite – diopside granite – diopside syenite. Its type granitoids described by us in Altai-Sajan area (Altai Mountain) and classified to post collisional setting, initiation by function Siberian superplum (Gusev, Gusev, Tabakaeva, 2008; Gusev, 2010).

The shoshonitic granitoids founded on Altai-Sajan region in much sites: Savvushinskiy (Rudnyi Altay), Aiskiy, Terandjiskiy, Tarchatinskiy areals (Gornyi Altai), Zhernovskoi, Borsukskiy, Gornovskoy (Salair), Saksyrskiy (Sajan), Askizskiy (Batenevskiy krjadg), Borok-Bibeevskiy (Tom-Kolyvanskaja zone), Beloiussko-Tuimskiy (Kuzneckiy Alatau). It type granitoids and of its areals occurred in the edges of stocks (square 2 – 96 km²) that has composite composition from monzogabbro to leicogranites. The stable paragenesis of dikes different composition from dolerites to granites with lamprophyres and massifs with appinites are watched in all areals. The lamprophyres are varies on different

types of rocks (spessartites, vogesites, minetts, kersantites), but minetts occur in all areals from mafic to felsic types, that its relate to alkaline-basaltic of mantle magmas.

The shoshonitic granitoids are characterized by contents SiO₂ from 52,77 to 71,85% and high sum alkali K₂O + Na₂O (more > 8%, average 9,14%), ratio K₂O/Na₂O (more > 1, average 1,50) and ratio Fe₂O₃/FeO (0,85–1,51, average 1,01) and low content TiO₂ (0,15–1,12%, average 0,57%). It type granitoids are characterized by high concentrations Ba and Sr. J. Tarney and C. Jones (1994) drew specific attention to these elements, together with low Rb and consequent high K/Rb, low Th, U and Nb, and very low Y and heavy REE relative to other trace elements, the combination of which defines the high Ba-Sr granitoid group in Scotland. Before L.V. Tauson separated latite geochemical type granitoid (Tauson, 1977), that it is correspond shoshonite and high Ba-Sr types. The content of Al₂O₃ in rocks vary from 13.01 to 19,20% and very variable. The granitoids enrich by LILE, LREE and volatile components, such as F, B and other. The biotite of shoshonitic granitoids classify to ferruginous phlogopite with minor fraction estonite and high ratio Mg/(Mg + Fe_c) and Fe₃+/Fe₂+. Amphibole classify to edenite hornblende and

magnesian hastingsite with some fraction edenite and high ratio $Mg/(Mg + Fe_2)$ и $Fe_3 + /Fe_2 +$.

The representable analysis of rocks some intrusive massifs with shoshonitic granitoids tabulate in table 1.

Table 1

The representable analysis of shoshonitic granitoids some intrusive massifs
(main components in %, elements – ppm)

Components	1	2	3	4	5	6	7	8
SiO ₂	70,31	66,31	71,97	61,87	66,11	72,87	75,05	76,88
TiO ₂	0,42	0,49	0,17	1,20	0,47	0,16	0,13	0,11
Al ₂ O ₃	14,08	16,44	14,16	17,28	16,64	13,96	13,67	12,92
Fe ₂ O ₃	2,09	1,39	0,72	2,12	1,44	0,75	0,56	0,37
FeO	1,10	1,35	0,81	2,01	1,37	0,83	0,65	0,36
MnO	0,06	0,08	0,04	0,12	0,09	0,04	0,03	0,03
MgO	1,10	1,11	0,33	0,67	1,01	0,37	0,22	0,11
CaO	2,65	2,13	0,5 9	2,12	2,10	0,49	0,59	0,32
Na ₂ O	3,82	4,91	4,65	3,04	4,89	4,61	3,89	4,09
K ₂ O	3,58	5,15	4,62	8,95	5,12	4,72	4,65	3,93
П.п.п	0,05	0,21	0,31	0,40	0,23	0,32	0,42	0,41
P ₂ O ₅	0,58	0,18	0,05	0,16	0,16	0,05	0,03	0,03
Σ	99,23	99,73	99,27	99,96	99,63	99,17	99,89	99,56
Li	43,1	27,5	30,4	18,8	27,6	55	4,5	10,8
Rb	107,2	94,2	125,5	109	78,9	145	164	172
Cs	2,4	2,4	3,1	2,2	2,8	3,6	7,5	1,9
Be	5,1	1,5	5,5	3,8	0,7	5,3	6,7	0,7
Sr	1063	2520	2200	8750	630	2280	20	8
Ba	1100	1990	2500	1956	750	2310	40	20
La	47,0	66	47	46	73	74	55	32
Ce	69,3	74	86	58	86	97	63	36
Nd	28,2	22	25	24	24	29	16	8,6
Sm	5,67	4,6	5,5	5,4	4,2	5,5	2,2	0,9
Eu	1,44	1,37	1,64	1,42	1,23	1,21	0,68	0,13
Gd	5,0	3,6	4,5	6,1	3,3	4,1	2,1	0,9
Tb	0,73	0,9	1,11	0,94	0,52	0,61	0,26	0,11
Dy	1,21	2,3	4,1	3,9	2,3	1,2	1,6	0,7
Tm	0,3	0,3	0,5	0,4	0,3	0,2	0,2	0,2
Yb	1,18	2,4	3,1	2,8	1,22	1,6	1,1	1,4
Lu	0,16	0,3	0,5	0,4	0,3	0,25	0,21	0,2
Y	9,6	11,8	13,7	14,7	7,8	13,6	13,4	10,4
Sc	4,3	5,7	6,5	5,7	5,6	4,2	3,3	1,3
Th	1,56	4,5	15,8	5,4	24	27	41	48
Hf	4,6	4,8	4,9	18	5,2	6,9	4,6	4,6
Ta	0,6	1,5	0,5	0,9	1,66	3,2	2,2	4,8
Nb	3,2	5,2	6,3	22,7	35,3	87,6	85,2	77
Zr	221	318	334	276	243	238	204	215

The analysis complete: for main components – by chemical method, for elements- by method ICP-ms IMGRE (c, Moscow), Salair: Gornovskoy massif: 1 – granite; Zhernovskoi massif: 2 – sy-

enite; Gornyi Altai: Terandjiskiy massif: 3 – granite; Gornyi Altai: Aiskiy massif: 4 – syenite, 5 – granosyenite, 6 – granite, 7 – leicogranite, 8 – leicogranite with fluorite

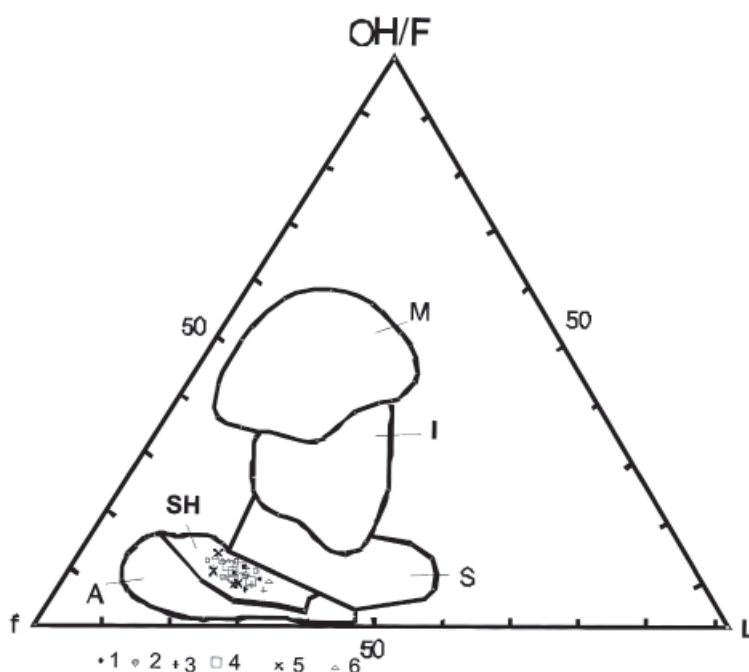


Fig.1. Diagram f- L- OH/F in biotites of granitoids:

f – total mafic index of biotites ($f = \text{Fe} + \text{Mn}/\text{Fe} + \text{Mn} + \text{Mg}$); L – aluminous of biotites ($L = \text{Al}/\text{Si} + \text{Al} + \text{Fe} + \text{Mg}$); OH/F – ratio hydroxyle group to fluorine in composite biotites. Standard type granitoids: M – mantle MOR, backarc basins (in composition of ophiolite complexes); I – mantle-crustal of island arc, transform, active continental margins, collision settings; S – crustal and mantle-crustal of collision settings and complexes metamorphic cores; SH – shoshonitic type granitoids of post collision settings, initiating by plum tectonic; A – mantle-crustal and mantle of anorogenic settings (intracontinental rifts, hot spots, mantle plumes). The shoshonitic granitoids of massif region: 1 – Aiskiy; 2 – Gornovskoy; 3 – Terandjiskiy; 4 – Tarchatinskiy, 5 – Tarchatinskiy; 6 – Beloiussko-Tuimskiy

The under study rocks of region fall on diagram (on composite of biotites) in field of shoshonitic granitoids (fig. 1),

A potential ore mineralization of intrusive complexes and separate bodies

can be determine by path of calculation rare metal index – $F(\text{Li} + \text{Rb})/(\text{Sr} + \text{Ba})$ to L.V. Tauson (1977) with account of distinction fluid regime and concentration of volatile components in it (F , H_2O , B).

The values of rare metal index and other necessary data on example Aiskiy massif actuation in table 2. Analysis of table 2 show that appreciable increase concentration F and rare metal index occur from monzogabbro to leicogranite. The values of rare metal index (6178,3) and petro-

geochemical parameters are very closely to peraluminous rare metal leicogranites (rare metal index 6800). The analogous parameters for leicogranite with fluorite, that it is paragenetic connect greisens and pegmatites deposits of Sn, Ta, Nb under investigation region.

Table 2

Concentration rare elements and values of rare metal index in rocks of Aiskiy massif

Rocks	F, %	Li, г/т	Rb, г/т	Sr, г/т	Ba, г/т	F(Li+Rb)/(Sr+Ba)
Monzogabbro	0,02	21,2	95	1950	2070	5,78
Monzonite	0,03	20,5	104	2720	1970	7,96
Melanosyenite	0,04	30,1	125	2200	2500	13,2
Syenite	0,08	18,8	109	8750	1956	9,54
Granosyenite	0,10	27,6	78,9	630	750	77,2
Granite	0,12	55	145	280	310	406,8
Leicogranite	0,22	4,5	164	20	40	6178,3
Leicogranite with fluorite	0,85	10,8	172	7	20	57548,1

The intrusive massifs of shoshonite granitoids in Altai-Sajan region, with it connect W-Mo skarns (Plitninskoe, Aturkolskoe deposit), W-Mo greisens (Orlinoe, Osokinskoe, Osinovskoe deposits) and lode W-Mo deposits (High-Belokurichinskoe, Dmitrievskoe, Batunkovskoe), lode Be (Kazandinskoe), pegmatitic and greisens beryllium (Kuranovskoe), Ta-Nb (River Slepoy), Li deposits, so lode gold-sulfide-quartz (Atbashi) manifestations. The skarns deposits complex W-Sn with Au known in the contact of massif Karagu (West Karagu, East Karagu).

The pegmatitic deposit Ortitovoe confine in Savvushinskiy massiv of shoshonitic granitoids in Rudnyi Altay. The allanite is main ore mineral on it pegmatite. Allanite occur in disseminate form and it form large crystals to 30 sm in length. It

associated with schörl, albite, muscovite, rauhtopaz.

The complex deposit Au-U-W confine in the contact of intrusive Tarchatinskiy areal of shoshonitic granitoids (Gorniy Altay). The lodes of deposit Elangash contain nasturane, gold, scheelite, wolframite.

In the final report follow to say, that the shoshonitic granites of Altai-Sajan region derived in compound post collision setting, initiation by function Siberian superplum and it characterized by saturate volatile components (F, H₂O, B). There are define of it potential ore mineralization.

The different deposits and manifestations of W, Mo, Ta, Nb, Au, Be, REE known in paragenesis and space link with shoshonitic granites in Altai-Sajan region (Kuzneckiy Alatau, Salair, Sajan).

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ABOUT EFFECT OF «SPLITTING» FOR THE DIFFERENTIAL OPERATOR OF THE FOURTH ORDER WITH THE SUMMABLE POTENTIAL

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In article the differential operator of the fourth order with summable potential is considered. It is received the asymptotics of the solutions of the given differential equation by introducing of the integral equation. For the equations of the second order the asymptotics of the solutions has been received by Vinokurov V.A. and Sadovnichii V.A. in 1998. Their technique on the equations of order above the second is not transferred.

Boundary conditions are picked up in such a manner that multiple «in the main» a series of eigenvalues «is split» on three unitary. Earlier (in 1997) this effect has been noticed by the author for the equation of the second order with discontinuous coefficients. It is received the asymptotics of eigenvalues of the considered differential operator. The deduced formulas it is enough for learning of the asymptotics of eigenfunctions and formulas of the first regularized trace of the studied operator.

All results of article are original and actual.

Key words: differential operators, asymptotics of eigenvalues, asymptotics of eigenfunctions, effect of «splitting», boundary conditions, summable potential

§1. Problem statement

Let's consider the differential operator of the fourth order with the sum-

mable potential, which is given by the differential equation

$$y^{(4)}(x) + q(x)y(x) = \lambda \cdot a^4 \cdot y(x), \quad 0 \leq x \leq \pi, \quad a > 0, \quad (1)$$

and boundary conditions of a following kind:

$$y(0) = y''(0) = 0; \quad y(\pi) = \alpha_0 \cdot y\left(\frac{\pi}{2}\right); \quad y''(\pi) = \alpha_2 \cdot y''\left(\frac{\pi}{2}\right), \quad (2)$$

$$\alpha_0 + \alpha_2 = 4, \quad \alpha_0 \in R, \quad \alpha_2 \in R, \quad (3)$$

where λ is the spectral parameter, function $q(x)$ is called as potential.

We will assume that the potential is a summable function on a segment $[0; \pi]$:

$$q(x) \in L_1[0; \pi] \Leftrightarrow \left(\int_0^x q(t) dt \right)'_x = q(x) \text{ almost everywhere for } x \in [0; \pi] \quad (4)$$

Differential operators of a kind (1)–(2) with a condition (4) have started to be

studied recently. Fundamental work [1] for the differential operator of the second or-

der has appeared in the 2000 year. In it for the differential operator of the second order with summable potential it is received asymptotics of any order for solutions of the differential equation and asymptotics of eigenvalues of any order. In work as the [2] method which is distinct from a method of work [1], the differential operator of the fourth order in case of summable potential was studied. In the monograph [3] method of the work [2] is generalised on the differential operator of the $2n$ -th ($n = 2, 3, 4, \dots$) order, on the functional-differential operators of the second and fourth order, and on the differential operators with discontinuous weight function.

The condition (3) provides so-called «effect of splitting» multiple in the main eigenvalues of the considered differential operator which in work [4] was consid-

ered by the author for the differential operator of the second order with discontinuous potential. As far as it is known to the author, for a case of differential operators of the fourth and higher order the given effect was not studied even for a case of the smooth potential.

§2. Asymptotics of the solutions of the differential equation (1) at $|s| \rightarrow +\infty$

For studying of asymptotics of eigenvalues of the boundary problems connected with the differential operator (1)–(3), it is necessary to know of the asymptotics of the solutions differential equation (1).

Let $\lambda = s^4$, $s = \sqrt[4]{\lambda}$ – some fixed branch of a root chosen by a condition $\sqrt[4]{1} = +1$. Let ω_k are the roots of the fourth degree from unit, that is

$$\omega_k^4 = 1, \quad \omega_k = \sqrt[4]{1} = e^{\frac{2\pi i(k-1)}{4}}; \quad k=1,2,3,4, \quad \omega_1 = -\omega_3 = 1, \quad \omega_2 = -\omega_4 = i.$$

Numbers ω_k are on the unit circle and divide it into four equal parts.

In the work [2] we have proved the following theorem.

Theorem 1. The general solution of the differential equation (1) has the following expression:

$$y(x, s) = \sum_{k=1}^4 C_k \cdot y_k(x, s), \quad y^{(m)}(x, s) = \sum_{k=1}^4 C_k \cdot y_k^{(m)}(x, s), \quad m = 0, 1, 2, 3, \quad (5)$$

where C_k ($k=1,2,3,4$) – arbitrary constants, $y_k(x, s)$ – linearly independent solutions

of the differential equation (1), and for $|s| \rightarrow +\infty$ are valid following asymptotic decomposition:

$$y_k^{(m)}(x, s) = (as)^m \cdot \left\{ \omega_k^m \cdot e^{a\omega_k sx} - \frac{1}{4a^3 s^3} \cdot A_{3k}^m(x, s) + O\left(\frac{e^{\operatorname{Im}(|s|x)}}{s^6}\right) \right\}, \quad k=1,2,3,4,$$

$$A_{3k}^m(x) = \sum_{n=1}^4 \frac{\omega_n^m}{\omega_n^3} \cdot e^{a\omega_n sx} \cdot \int_0^x q(t) \cdot e^{a(\omega_k - \omega_n)st} \cdot dt_{qkn}, \quad m = 0, 1, 2, 3. \quad (6)$$

Following formulas are thus true:

$$y_k(0;s)=1; \quad y_k^{(m)}(0;s)=(as)^m \cdot \omega_k^m; \quad k=1,2,3,4, \quad m=0,1,2,3. \quad (7)$$

An idea of decomposition of a kind (6)–(7) we have stated in the chapter 5 of the monograph [3].

The fundamental system of solutions $\{y_k(x,s)\}$, $k=1,2,3,4$, for the differential equation (1) is a generalization of the fundamental system of solutions for the differential operator of the second

order, which is consisting from Josta's functions.

§3. Studying of boundary conditions (2)

From boundary conditions (2) by means of formulas (5)–(7) it is received:

$$y(0)=0 \Leftrightarrow \sum_{n=1}^4 C_n \cdot y_n(0,s)=0 \Leftrightarrow \sum_{n=1}^4 C_n \cdot 1=0, \quad (8)$$

$$\frac{y''(0)}{(as)^2}=0 \Leftrightarrow \sum_{n=1}^4 C_n \cdot \frac{y_n''(0,s)}{(as)^2}=0 \Leftrightarrow \sum_{n=1}^4 C_n \cdot \omega_n^2=0. \quad (9)$$

The system of the equations (8)–(9) represents the system of two equations with four unknown vari-

ables which owing to conditions $\omega_1^2=\omega_3^2=1$, $\omega_2^2=\omega_4^2=-1$ has the unique solution

$$C_3=-C_1, \quad C_4=-C_2 \quad (10)$$

Substituting formulas (10) and (5)–(6) in the remained two boundary conditions from (2), we will receive system from two equations with two unknown variables which has nonzero solutions in that and only that case when

the determinant of this system is equal to zero.

Therefore the following statement is true.

Theorem 2. The equation on the eigenvalues of differential operator (1)–(2)–(3) has the following expression:

$$f(s)=\begin{vmatrix} a_{11}-\frac{B_{311}(s)}{4a^3s^3}+O_1\left(\frac{1}{s^6}\right) & a_{12}-\frac{B_{312}(s)}{4a^3s^3}+O_2\left(\frac{1}{s^6}\right) \\ a_{21}-\frac{B_{321}(s)}{4a^3s^3}+O_3\left(\frac{1}{s^6}\right) & a_{22}-\frac{B_{322}(s)}{4a^3s^3}+O_4\left(\frac{1}{s^6}\right) \end{vmatrix}=0, \quad (11)$$

in which the following designations are entered:

$$a_{11}=z^{2\omega_1}-z^{-2\omega_1}-\alpha_0 \cdot z^{\omega_1}+\alpha_0 \cdot z^{-\omega_1}; \quad a_{12}=z^{2\omega_2}-z^{-2\omega_2}-\alpha_0 \cdot z^{\omega_2}+\alpha_0 \cdot z^{-\omega_2};$$

$$a_{21}=\omega_1^2 \cdot [z^{2\omega_1}-z^{-2\omega_1}-\alpha_2 \cdot z^{\omega_1}+\alpha_2 \cdot z^{-\omega_1}]; \quad a_{22}=\omega_2^2 \cdot [z^{2\omega_2}-z^{-2\omega_2}-\alpha_2 \cdot z^{\omega_2}+\alpha_2 \cdot z^{-\omega_2}];$$

$$\begin{aligned}
B_{311}(s) &= [A_{31}(\pi, s) - A_{33}(\pi, s)] - \alpha_0 \cdot \left[A_{31}\left(\frac{\pi}{2}, s\right) - A_{33}\left(\frac{\pi}{2}, s\right) \right], \\
B_{312}(s) &= [A_{32}(\pi, s) - A_{34}(\pi, s)] - \alpha_0 \cdot \left[A_{32}\left(\frac{\pi}{2}, s\right) - A_{34}\left(\frac{\pi}{2}, s\right) \right], \\
B_{321}(s) &= [A_{31}^2(\pi, s) - A_{33}^2(\pi, s)] - \alpha_2 \cdot \left[A_{31}^2\left(\frac{\pi}{2}, s\right) - A_{33}^2\left(\frac{\pi}{2}, s\right) \right], \\
B_{322}(s) &= [A_{32}^2(\pi, s) - A_{34}^2(\pi, s)] - \alpha_2 \cdot \left[A_{32}^2\left(\frac{\pi}{2}, s\right) - A_{34}^2\left(\frac{\pi}{2}, s\right) \right]. \quad (12)
\end{aligned}$$

In formulas (11)–(12) we have entered a following designation:

$$z = e^{as\frac{\pi}{2}}, \quad z^2 = e^{as\pi}.$$

Expanding the determinant from (11) on columns for the sum of determinants, using properties of determinants, we receive:

$$\begin{aligned}
f(s) &= \{f_0(s)\}_{\text{och}} - \frac{1}{4a^3s^3} \cdot B_3(s) + O\left(\frac{1}{s^6}\right) = 0, \\
B_3(s) &= \begin{vmatrix} B_{311} & a_{12} \\ B_{321} & a_{22} \end{vmatrix} + \begin{vmatrix} a_{11} & B_{312} \\ a_{21} & B_{322} \end{vmatrix}, \quad (13)
\end{aligned}$$

$$f_0(s) = \begin{vmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{vmatrix} = \begin{vmatrix} z^{2\omega_1} - z^{-2\omega_1} - \alpha_0 z^{\omega_1} + \alpha_0 z^{-\omega_1} & z^{2\omega_2} - z^{-2\omega_2} - \alpha_0 z^{\omega_2} + \alpha_0 z^{-\omega_2} \\ z^{2\omega_1} - z^{-2\omega_1} - \alpha_2 z^{\omega_1} + \alpha_2 z^{-\omega_1} & -z^{2\omega_2} + z^{-2\omega_2} + \alpha_2 z^{\omega_2} - \alpha_2 z^{-\omega_2} \end{vmatrix}. \quad (14)$$

The equation «in the main approach» on the eigenvalues for the equation (13)–(14) is the equation

$$f_0(s) = 0. \quad (15)$$

Expanding the determinant from (14)–(15) more details, it is possible to understand that the indicator diagram (that is the convex polygon constructed on powers of exponents, entering into the equation (15), see [3]), is a square, with tops $A(2; 2)$, $B(-2; 2)$, $C(-2; -2)$, $D(2; -2)$, and on each of the sides of this

square there are two points. We will tell, on the side AB there are points $H(-1; 2)$ and $E(1; 2)$. Eigenvalues of the boundary problem (1)–(3) considered by us there are in four sectors of the infinitesimal angles which bisectors are middle perpendiculars to the sides of square $ABCD$.

Theorem 3. The equation on eigenvalues «in the main» of the boundary prob-

lem (1)–(2)–(3) for the side AB of a square $ABCD$ has the following appearance:

$$g_0(s) = z^{2\omega_1+2\omega_2} - \frac{\alpha_0 + \alpha_2}{2} \cdot z^{\omega_1+2\omega_2} + \frac{\alpha_0 + \alpha_2}{2} \cdot z^{-\omega_1+2\omega_2} - z^{-2\omega_1+2\omega_2} = 0. \quad (16)$$

Substituting the condition (4) in the equation (16) we can divide on $z^{2\omega_2} \neq 0$ and by replacement $z^{\omega_1} = X$ reduce the equation (16) to the equation of the fourth degree $X^4 - 2X^3 + 2X - 1 = 0$, which has a simple root $X_4 = -1$ and a third-tuple root $X_1 = X_2 = X_3 = 1$.

Let's consider the sector connected with segment AB . We will leave in the equation (12) only the main terms on growth exponents.

Theorem 4. The equation on eigenvalues of the boundary problem (1)–(2)–(3) for the side $BEHA$ of a square $ABCD$ has the following appearance:

$$g(s) = g_0(s) - \frac{1}{4a^3s^3} \cdot g_3(s) + O\left(\frac{1}{s^6}\right) = 0, \quad (17)$$

and it is possible to write out $g_3(s)$ in an explicit form, considering formulas (11)–(13).

§4. Asymptotics of eigenvalues of the differential operator (1)–(3)

Let's consider at first a case simple «in the main» eigenvalue $X_4 = -1$. In this case we have:

$$X_4 = z^{\omega_1} = -1 \Leftrightarrow e^{a\omega_1 s \frac{\pi}{2}} = -1 \Leftrightarrow a\omega_1 s \cdot \frac{\pi}{2} = 2\pi ik + \pi i \Leftrightarrow s_{k,4} = \frac{(4k+2) \cdot i}{a}$$

– the basic approach for the side $BEHA$. Therefore the methods stated in the fifth chapter of the monograph [3], prove the following theorem.

Theorem 5. Asymptotics of eigenvalues of the boundary problem (1)–(2)–(3) in sector of segment $BEHA$ of the indicator diagram has the following appearance:

$$s_{k,1} = \frac{iK_1}{a\omega_1} + \frac{id_{3k,4}}{a\omega_1 \cdot K_1^3} + O\left(\frac{1}{K_1^6}\right), \quad K_1 = 4k + 2, \quad \omega_1 = 1 \quad (18)$$

and the coefficient $d_{3k,4}$ is equal

$$d_{3k,4} = \frac{1}{8\pi} \cdot \left[\int_0^\pi q(t) dt_{q11} - \int_0^\pi q(t) \cdot \cos((8k+4)t) dt_2 + 2 \int_0^{\frac{\pi}{2}} q(t) dt_{q11} - 2 \int_0^{\frac{\pi}{2}} q(t) \cdot \cos((8k+4)t) dt_2 \right]. \quad (19)$$

Asymptotics of the roots of the equation (17), considering formulas (16), (12)–(14), we will search by the method consecutive approaches of Horn. We will substitute the formula (18) in the equation (17) and we will equate coefficients by the same degrees K_1 . We will come to a conclusion that the formula (19) is true.

Let's consider now a case of a third-tuple root $X_1 = X_2 = X_3 = 1$.

Theorem 6. Asymptotics of eigenvalues of the boundary problem (1)–(2)–(3) in sector of segment BEHA of the indicator diagram has the following kind:

$$s_{k,4,m} = \frac{4ki}{a\omega_1} + \frac{id_{1k,4,m}}{a\omega_1 \cdot k} + \frac{id_{2k,4,m}}{a\omega_1 \cdot k^2} + \frac{id_{3k,4,m}}{a\omega_1 \cdot k^3} + O\left(\frac{1}{k^4}\right), \quad (20)$$

and the factor $d_{1k,4,m}$ is equal

$$d_{1k,4,m} = -\frac{1}{4\pi} \cdot \sqrt[3]{2} \cdot e^{\frac{2\pi i}{3}(m-1)} \times \\ \times \sqrt[3]{\int_0^\pi q(t)dt - \int_0^\pi q(t)\cos(8kt)dt - 2 \cdot \int_0^{\frac{\pi}{2}} q(t)dt + 2 \cdot \int_0^{\frac{\pi}{2}} q(t)\cos(8kt)dt}, \quad (21)$$

where $m = 1, 2, 3$, that is we see that there was «splitting» multiple (third-tuple) «in the

main» a root on three simple series of eigenvalues of the boundary problem (1)–(2)–(3),

$$d_{2k,4,m} = \frac{1}{96\pi^3} \cdot \frac{1}{d_{1k,4,m}} \cdot \left[\pi \cdot \int_0^\pi q(t)\sin(8kt)dt_4 - 2 \cdot \int_0^\pi tq(t)\sin(8kt)dt_5 - \pi \cdot \left(\int_0^{\frac{\pi}{2}} \dots \right)_4 + 4 \cdot \left(\int_0^{\frac{\pi}{2}} \dots \right)_5 \right], \quad (22)$$

under the condition $d_{1k,4,m} \neq 0$, (and, if $d_{1k,4,m} = 0$, then $d_{1k,4,m} = d_{2k,4,m} = d_{3k,4,m} = \dots = 0$, and

all eigenvalues of the boundary problem (1)–(2)–(3) are found in an explicit form under the formula

$$s_{k,4,m} = \frac{4ki}{a\omega_1}, \quad (23)$$

$$d_{3k,4,m} = \frac{\pi^2}{48} \cdot d_{1k,4,m}^3 - \frac{d_{2k,4,m}^2}{d_{1k,4,m}} + \frac{1}{128\pi^3 d_{1k,4,m}} \times \\ \times \left[-\int_0^\pi q(t)dt_1 + \int_0^\pi q(t)\cos(8kt)dt_3 + 2 \cdot \left(\int_0^{\frac{\pi}{2}} \dots \right)_1 - 2 \cdot \left(\int_0^{\frac{\pi}{2}} \dots \right)_3 \right] + \\ + \frac{1}{192\pi^3} \cdot \frac{1}{d_{1k,4,m}^2} \cdot \left[\pi^2 \cdot d_{1k,4,m}^2 \cdot \int_0^\pi q(t)dt_1 - 4 \cdot d_{2k,4,m} \cdot \int_0^\pi tq(t)\sin(8kt)dt_5 + \dots \right] \quad (24)$$

The remark. If instead of the differential equation (1) we will consider the equation

$$y^{(4)}(x) + p(x)y'(x) + q(x)y(x) = \lambda \cdot a^4 \cdot y(x), \quad 0 \leq x \leq \pi, \quad a > 0,$$

sidered formulas (18) and (20) will be re-

with boundary conditions (2)–(3) (exactly such differential equation the author has considered in the work [2]), then the con-

written in a kind

$$s_{k,1} = \frac{iK_1}{a\omega_1} + \frac{id_{2k,4}}{a\omega_1 \cdot K_1^2} + \frac{id_{3k,4}}{a\omega_1 \cdot K_1^3} + O\left(\frac{1}{K_1^6}\right), \quad K_1 = 4k + 2, \quad \omega_1 = 1,$$

$$s_{k,4,m} = \frac{4ki}{a\omega_1} + \frac{id_{1k,4,m}}{a\omega_1 \cdot k^{\frac{2}{3}}} + \frac{id_{2k,4,m}}{a\omega_1 \cdot k^{\frac{4}{3}}} + \frac{id_{3k,4,m}}{a\omega_1 \cdot k^{\frac{6}{3}}} + O\left(\frac{1}{k^{\frac{8}{3}}}\right), \quad m = 1, 2, 3$$

(that is there is «splitting» on fractional degrees).

If we will renumber the sectors connected with sides AB , BC , CD , DA of the

square $ABCD$ by numbers 1, 2, 3, 4 then the following theorem is fair. (Its proof is similar to the proof of theorems 5 and 6).

Theorem 7.

$$s_{k,n,m} = s_{k,1,m} \cdot z^{m-1} = s_{k,1,m} \cdot i^{m-1}, \quad n = 1, 2, 3, 4. \quad (25)$$

The formulas similar to formulas (18)–(24), for boundary problems of type (1)–(2)–(3), can be received and for cases of differential operators of the sixth and eighth orders.

Formulas (18)–(24) it is enough for calculation of the first regularized trace of the differential operator (1)–(2)–(3).

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*Materials of Conferences***LIPID EXCHANGE INDEXES
IN PIG BLOOD**

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In addition to academic interest, the study in the content of lipids and their metabolism in organism is of great practical value. Lipids make up a vast group of substances greatly different in their chemical composition, functions and content in different organisms. They play a great role in vital processes. Lipids being one of the basic components of biological membranes, they exert influence upon the membranes permeability. They are involved in creating intercellular contacts to transmit nerve impulses. To protect different organs and tissues against mechanical impacts and produce thermoinsulating coatings of plants and animals is one of the main functions of lipids.

Successful achievements have been made to elucidate chemical structure of lipoproteins, composite proteins, that are composed of proteins and lipids. Fatty acids, neutral fats, cholesterids, phospholipids, etc., can be a part of lipoproteins. Lipoproteins are included in the composition of cellular, nuclear, mitochondrial and microsomal membranes. They can be found in nerve tissue, myelinic coats, retina, chicken egg-yolk, milk and blood serum. The composition of lipoproteins includes lipid nucleus surrounded by polar lipids and protein coating. Lipoproteins perform different biological functions. Cardiolipin, in particular, extracted from heart muscle has immune properties.

Lipoproteins can undergo peroxide modification that mainly occurs in arterial wall, but can happen in blood channel. The relationship is identified between the quantity of products of peroxide oxidation of lipids in blood and the emergence of cataract and atherosclerosis. Under the peroxide oxidation of lipids multiple breaks in membranes during chain reactions take place and may cause cell destruction.

An experiment was carried out at Closed Joint Stock «Landrace» in Novosibirsk region. The content of total lipids was examined in the blood serum of Landrace pigs during postnatal development. The animals were selected and grouped by the principle of analogues with regard to origin, breed, productivity, age and live weight. The pigs were kept following the technology for complexes

and farms. The blood to examine was taken from aural vein. Statistical processing of the data was done with the package of applied software Statistica 6 and Excel.

The data obtained showed that lipid concentration in the blood serum gradually increases during postnatal development of the pigs. The lowest content of the examined parameter was found in 2-month pigs. At the age of 4 months the level of blood lipids was much higher. The highest content of the examined parameter was observed in 6-month gilts. In this age period the concentration of lipids was by 33,42 % higher ($p < 0,001$) in comparison with the animals aged 2 months.

The experiment detected a considerable growth of the level of blood lipids in the 6-month gilts and this testifies to intensive fattening in the period of ontogenesis.

**XANTHINE OXIDASE ACTIVITY
OF PIG BLOOD**

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The search for blood tests to predict productive blood traits is a pressing issue. The choice of optimal spectrums of enzymes catalyzing different metabolic reactions is the basis of enzymatic prognostication of animal productivity.

An experiment was carried out on the training farm «Tulinskoye» of Novosibirsk State Agrarian University. Precocious Meat pig breed of Novosibirsk breeding that is well-adapted to local natural and climatic conditions was the object of research.

The research was carried out on control fattening animals aged 2, 3, 4, 5 and 6 months. In the experiment the offspring of six Precocious Meat boars was under the control (Svetly 1704, Sovet 1618, Sayan 25, Som 60, Sobol 139 and Signal 1440).

The animals were selected to be grouped following the principle of analogues with regard to origin, breed, productivity, age and live weight. The pigs were kept following the technology for complexes and farms. Blood to examine was taken from aural vein. Statistical processing of the data was done with the package of applied software Statistica

6 and Excel. The activity of xanthine oxidase in the pigs blood serum was identified. The examined enzyme took part in metabolism of nucleic acids. The influence of the Precocious Meat boars upon the activity of xanthine oxidase in the offspring blood serum was examined. Age variability of the enzyme activity was determined to depend upon restructuring of metabolic processes in different periods of postnatal ontogenesis.

It was found that the offspring of all the boars had different mean levels of the enzyme activity in different age periods. The 2 and 5 month offspring had the highest activity of the enzyme. At the age of 6 months the xanthine oxidase activity was by 32,0% ($p < 0,001$) higher in Sobol 139 than in Sayan 225. The enzymatic activity of blood was different in the animals different in productive traits.

Correlations between the blood enzymatic activity and economically valuable traits of pigs were examined. It was identified that the correlation levels changed during ontogenetic development. In ontogenesis the correlations changed both in strength and direction.

The data obtained testifies to the influence of boar's genotype upon the level of xanthine oxidase activity in offspring.

rect concern to organization of lymph flow from organs. In the project are taken into account too:

1) inconstancy of cervical and abdominal parts of thoracic duct, its cervical arch and (terminal) cisterna, initial (abdominal) chyle cisterna, right lymphatic duct;

2) variants of formation of thoracic duct (chyle cisterna, plexus of lumbar trunks or their simplex confluence), its thoracic part (existence of semithoracic duct and another collaterals) and chyle cisterna (own of the duct, of lumbar trunk or transitive from lumbar trunk to the duct), tributaries of lymphatic ducts and their main roots in connection with regional lymph nodes;

3) the connections of lymphatic ducts and trunks with cervical veins;

4) regional lymphatic paths (of head and neck, upper and lower limbs, thoracic, abdominal and pelvic), constant and often discovered, including collaterals and plexuses. I put inconstant formations of lymphatic system in brackets.

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LYMPHATIC SYSTEM: PROJECT OF DIVISION IN THE INTERNATIONAL ANATOMICAL TERMINOLOGY

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Lymphatic system plays important role in human life, its structure is studied and described in detail in literature. But in the International Anatomical Terminology (1998) the proper division is absent. I propose the project of such division as addition to the Terminology and is formed on the principles of Terminology. The project consists of three parts – the general terms, the main lymphatic collectors (thoracic duct and right lymphatic duct) and the regional lymphatic paths (on the regions of human body). In the project are included such additional terms, as «lymphatic postcapillary» and «lymphatic vessel unimascular type», «valvar cylinder», «lymphatic sinuses», «lymphatic trunk», «lymphatic duct» – all these formations have di-

INFLUENCE OF THE WAYS OF THE BIOCHEMICAL MATURATION HERRING PACIFIC ON CHANGE STRUCTURED-MECHANICAL FACTORS

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The impact of various Pacific herring maturing methods under the production of salted output on the rheological indexes alteration is defined

Biochemical processes that take place within the process of the fish maturing cause alterations in rheological characteristics of muscle tissue. The muscle tissue tenderization while maturing is an important sensory characteristic. The speed of the fish's tissue softening is directly dependent on the protease activity [1, 2]. We have developed methods of the Pacific herring maturing that allow us to increase the speed of the fish's biochemical maturing and shorten the duration of

the technological process: preliminary maturing of the unsalted herring under the regulated conditions (method 1) [3]; maturing that is combined with a defrosting, in the potassium chloride solution (method 2).

To characterize the rheological characteristics the research of the Pacific herring utmost shift tension (UST) alterations were carried out. The UST was defined with the structure-o-meter ST-1M by method that is based upon the definition of the cone loading tension with its introduction to the definite depth into the product and the definition of the tension relaxation time, which is caused by its deformation.

Table one provides us with the data of the herring tissue UST alteration while using the maturing methods described above. Also the data of the UST alterations while using the traditional method of salted fish maturing are illustrated for comparison:

- experimental sample 1 – preliminary maturing under the refrigeratory keeping in regulated conditions;
- experimental sample 2 – herring maturing in potassium chloride solution;
- experimental sample 3 – salted herring maturing with the content of sodium chloride in tissue 3,5-4% (traditional method).

The alterations in Pacific herring UST in dependence of its keeping, kPascal

Sample	Keeping duration, days					
	0	2	4	6	8	10
Experimental sample 1	22,8	22,2	19,4	16,6	15,2	14,8
Experimental sample 2	22,4	21,9	20,7	17,8	16,4	15,4
Experimental sample 3	23,4	23,2	22,8	21,6	20,8	19,6

Within the process of the preliminary biochemical maturing (experimental sample 1) and under the herring keeping in potassium chloride solution (experimental sample 2) the softening of the fish's tissue takes place which is proved by the decrease in the utmost shift tension. The decrease flies faster in the experimental samples as the proteolytic herring ferments show the highest activity with the implementation of these methods.

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tion. Problems and solutions of a problem of agriculture economy and management theoretical and applied sociological, political and marketing researches», (Thailand), December, 20-30th, 2010, came to the editorial office on 22.11.2010.

MODIFIED CRYOPHERESIS IN AN INTEGRATED THERAPY OF RHEUMATOID ARTHRITIS PATIENTS

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The point of this research is the evaluation of the results of course modified cryopheresis (patent №2245167 of 27.01.2005) implementation within the patients with rheumatoid arthritis (RA) under the increase in the process activity and the impossibility of the traditional therapy implementation in its fullness.

72 patients with RA were involved into the research, 50 of them formed the major group and 22 of them formed the control group. The inclusion criteria were also defined. RA was in its active

phase within all the patients. 4 or more ACR criteria for RA were registered. Laboratory showings of the rheumatism process activity were being defined according to unified methods with the «Labsistem» complex. The dynamics of immunological indexes and the microcirculation condition were estimated according to the data cognunkival biomicroscopy. In average within the cryoapheresis course that consisted of 5-6 procedures (every other day), 3500 ml of plasma went through the processing. Night and morning joint pains reduced and ended under the impact of complex therapy, the volume of movement widened more comparative to the control group. Richie index reduced from $26,2 \pm 1,1$ to $16,2 \pm 0,9$ ($p < 0,001$). Within the control group – from $24,1 \pm 1,2$ to $20,1 \pm 1,0$. VAS index – from $72,3 \pm 4,6$ to $35,3 \pm 2,9$ ($p < 0,05$). Within the control group – from $68,4 \pm 3,7$ до $58,4 \pm 2,7$. Statistically-significant decrease in blood sedimentation rate, seromucoid, sialic acids, fibrinogen, CRC, rheumatoid factor, proline and oxiprolin, glucosamioglycans fractions in blood was registered ($p < 0,01$). Significant positive alterations were registered also in the immunity in-

dexes (the increase in T-lymphocytes number, CRC decrease and all the immunoglobulines classes decrease, $p < 0,05$). The procedures of cryoapheresis have improved the indexes of microcirculation condition that displayed in the decrease in intravascular and perivascular indexes ($p < 0,01$). The cryoapheresis procedures have increase the efficiency of the following medicamental therapy. The positive impact of cryoapheresis has also displayed in rheocorrection, hemodelution effects, and the alteration of inflammation mediator concentration.

Cryoapheresis is an effective auxiliary pathogenetic method of the RA patients treatment. It allows us to achieve the decrease in the disease activity under the impossibility of the adequate basis therapy implementation in its fullness.

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Short Reports

**VEGETATION AND SOIL
DIFFERENTIATION WITHIN
THE LIMITS OF ECOTOPE
ON THE MIDDLE URAL REGION**

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Transformation of vegetation and soil, which takes place in dark-coniferous forests under the action of clear fellings, fires and haymaking in dominating forest conditions of the mountains of the Middle Urals (at the bottom of draining gentle slopes), was studied. It was found that strong anthropogenic effects lead to appearance of a wide spectrum of vegetation communities within a single forest ecotope (one type of radical forests). For a long time these vegetation communities differ by the structure of all vegetation layers, conditions of soil formation, and, consequently, by the direction and intensity of restoration processes.

Keywords: Dark-coniferous forests, anthropogenic transformation, vegetation differentiation, tree stand and subordinate layers, soil dynamics

Introduction

The increase in the transformation rate of biosphere ecosystems makes it very topical to preserve study natural complexes forming the biosphere and examine trends of their dynamics developing under the action of particular anthropogenic factors. Detailed quantitative studies are needed to further advance theoretical and methodical concepts underlying analysis of the structure of biogeocenoses and processes that take place in those biogeocenoses. This paper deals with the study of correlations in vegetation differentiation in dark-coniferous forests and soils under the action of clear fellings, fires, haymaking, and other anthropogenic effects in the mountains of the Middle Urals. This work was supported by the Presidium of RAS (project 09-II-4-1039).

Materials and Methods

The study was conducted (1999–2010) in Sverdlovsk region (57°00'–57°05' N and 60°15'–60°25' W). Test sites were located in similar geomorphological elements, namely at the bottom of draining gentle slopes, which represent the most widely occurring group of forest conditions. Sta-

ble fresh loamy soils are formed on gruss eluvium-talus deposits of crystalline rocks. As a result, podsolization and gleying processes are limited and brown-type soils become more frequent in these forest conditions (Firsova, 1977). Forest, geobotanic and soil conditions were examined in detail using universally accepted methods (Programs and methods..., 1974). Characteristics of the tree stand, soil, the conifer regrowth and the herbaceous-shrub layer are given in the Table. The number of regrowth was determined in two perpendicular strips 4×40 m in size, which were divided into boxes 2×2 m in size. Productivity of lower layers was examined in 6 to 20 boxes 1×1 m in size organized on each test site depending on particular mosaic pattern of the cover. Vegetation was cut at the soil level and the hay crop was analyzed for species.

Results and Discussion

The structure of formed phytocenoses was found to differ sharply within a single type of forest conditions for subradical spruce forests, derivative birch forests and post-forest hay meadows (see Table). Anthropogenic effects cause changes in structure of vegetation communities: the species composition and gross productivity of lower layers. The quantitative ratio of species is altered most. Species forming the main background of lower layers in spruce forests (*Oxalis acetosella*, *Asarum europaeum*, *Viola selkirkii*) lose sharply in their biomass in derivative birch forests and are absent altogether from phytocenoses in meadows. Derivative phytocenoses are dominated by species, which are occasionally present in subradical spruce forests: *Calamagrostis arundinacea*, *Carex sp. under the canopy of birch forests*, and *Cirsium heterophyllum*, *Trollius europaeus*, *Calamagrostis arundinacea*, *Deschampsia caespitosa*, *Crepis paludosa*, and *Agrostis tenuis* in hay meadows. Hay meadows are also distinguished for largest floristic diversity (55 species of vascular plants). The gross biomass increases (see Table). The gross biomass decreases only under the canopy of birch forests with unit spruce regrowth, where dead-cover synusias are formed mostly. Soils in post-catastrophic communities (derivative associations) are at different stages of demutation development. Humus and soil horizons are formed there in conjunction with development of forest vegetation during successions. Fellings in spruce forests of the Middle Ural region do not alter the type of soil formation in short-term derivative birch forests, which have,

Differentiation of structure of vegetation communities in a single forest type conditions
(P – *Picea obovata*, B – *Betula pendula*, B. *pubescens*)

Structural parameters	Spruce forest	Birch forest with thick spruce regrowth	Birch forest with thin spruce regrowth	Hay meadow
<i>Taxation characteristics of the tree stand</i>				
Age, years	190	65	65	-
Composition	6P4B	10B	10B	-
Sum cross-sectional area, m ² /ha	26,1	23,5	23,7	-
Mean height, m	26	24	20	-
<i>Soil</i>				
Name	mountain-forest brown	mountain-forest podsolized brown	mountain-forest brown	meadow-forest turf pale-yellow podsollic
Capacity of forest litter, sm	4	2	2	2
Capacity of the soil profile, sm	120	95	150	95–100
<i>Picea obovata</i> regrowth				
Number, thousands units / ha	+	4,0	0,5	+
Crown density, %	0,1	95	5	
Predominant height, m	0,1–0,5	5–10	2–7	
<i>Pinus sylvestris</i> regrowth				
Number, thousands units / ha	-	-	-	+
Crown density, %	-	-	-	+
Predominant height, m	-	-	-	0,1–0,3
<i>Lower layer (herb layer)</i>				
Species, total	23	21	44	55
Projective cover / coefficient of variation	21,0 26,6	14,4 56,9	66,3 27,5	100 19,5
Average height, cm	7	7	47,9	60
Gross biomass (g/m ² in air-dry state) / coefficient of variation	22,9 33,7	4,4 66,2	78,7 27,1	280,6 7,7

similar to subradical spruce forests (Zubareva, Firsova, 1963; Ivanova, Novogorodova, Chetkina, 2000), mountain-forest brown soils with a typical set of horizons: A0, A1, AB, B1, B2, and BC. The horizon depth depends mainly on the loamy layer thickness. The influence of the tree

canopy, which is restored after clear fellings, is readily seen in separate biogroups. The profile differentiation increases in conifer groves thanks to light horizons A1A2 and A2B: podsolized brown soils are formed. Horizons A0 and A1 are turfed, while the pale-yellow subhumus horizon

A1A2 is weakly podsolized in a 65-year hay meadow: meadow-forest pale-yellow podsolized turf soils are formed (Ivanova, Novgorodova, Chetkina, 2000). So, clear fellings and other anthropogenic effects cause appearance of a set of vegetation communities within a single ecotope (one radical forests type). For a long time these communities differ sharply by the structure of all vegetation layers and have specific features of soil formation. Consequently, they differ by the direction and intensity of restoration processes: from restoration of dark-coniferous forests to formation of appearance of polydominant multi-species herbaceous communities in hay meadows. They cannot be referred to one forests type or one vegetation association. Therefore it is necessary to study comprehensively convergence and divergence of vegetation in order to work out an objective classification and determine correctly the syntaxonomic rank of derivative phytocenoses.

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Materials of Conferences

**THE TRANSMISSION
TO ADAPTIVE-LANDSCAPE
LAND-USAGE SYSTEM IN STEPPE
LANDSCAPES OF STAVROPOL
REGION. HISTORICAL ANALYSIS**

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The activation of the land usage on the Stavropol region territory since the second half of the twentieth century led to changes in qualitative characteristics of the soil cover and the development of negative processes. The most impact on the soil happened in the end of the twentieth century. Thus, according to the data of Stavropol-NII Gerozem from 1996 to 2001 the number of the deflated soils increased by 123,9 thousand hectares (19,7%), eroded – 11,6 thousand hectares (1,3%), jointly destroyed by wind and water erosion – 13,6 thousand hectares (9,9%), overwatered – 55,6 thousand hectares (15,6%). The real annual loss from the Stavropol region soil funds degradation in prices of 2000 reaches 5 billion rubles. To explain the direction of soil production processes and develop the necessary measures of the fertility increase we need to study the history of the soil usage from the moment of the studied territory lands reclamation.

The historical analysis of the steppe landscapes land use of the Stavropol region with the usage of system approach which studies anthropogenic activity in definite landscape conditions as a single natural anthropogenic system, was carried out on the territory of landscapes situated in the regional centre, the area of joined black earth, solonetz and saline complexes that provide a great example of the irrational land use system. The research region soils were formed on the salted Maykop clay, that, in combination with the dismemberment of the relief surface and negative anthropogenic activity has defined wide development of the degradation processes. The initial insignificant signs of the soil transformation are linked to the landscape occupation by nomads: Nogais, Turkmen (that came from behind the Kaspyi in the 60-ies of the XVIII-th century), and Kalmyk. The feeding cattle-breeding didn't had a significant impact on the quality of the natural landscapes because of the small quantity of their husbandries and the presence of free lands (Zhelkanova, 1996).

Five stages that are linked to the land use systems development can be outlined in the natural landscape anthropogenic transformation that left a significant mark on the soil content.

Primitive (fallow and refallow) land use system that was practiced with the abundance of virgin plowing lands, low level of productive force, the domination of grain cultures in the sowing structure with the maximum usage of the natural soil fertility. The picture of the settlement situation and the time of their foundation on this stage reflect the natural landscape differentiation.

Simultaneously with the primitive land use system, with the decrease in the refallow date to one year and the widening of the grown cultures spectrum, in the beginning of the XX-th century *the steam (three-field) and brightfield-grass land use systems* became widely spread. The increase in the settlers number by 2,5 times lead to the decrease in the free land area. At the same time the estimation of the land fertility potential of the each definite region landscape was quite accurate. The land development was going in two directions. The fertile natural landscapes were getting involved into the intensive agricultural processing. By 1906 the plowing area was increased up to 50% of the allotment area. Peasants that used a plowing lot for two-three years, left it for the same period with no usage and used it as cattle pasture. The further increase in the settlers' number lead to the decrease in free lands quantity, so peasants started using brightfield and three-field system. In the second case lands that had unfavourable physical and chemical qualities were to be transferred to the Demesnil department. These lands became the property of the Royal family. They were not supposed to be ploughed up and were demised as cattle pastures from 1873 to 1885 to the owners of the large ship flocks. Further on the ploughing of the Demesnil land was regulated by a number of «conditions».

These land use systems existed till the period of collectivization (1930-ies). The ploughing of the region did not exceed 38% till the civil war.

The transitory grassfield system of land use that was developed by V.S. Williams, was recommended in 1920-ies–1930-ies instead of the classic three-field and existed up till the 50-ies. Its major goal was the land fertility increase in biological way, by sawing grass compositions from bean and cereal grass. Within the period of its supremacy the region's ploughing was under 42%.

The development of the intensive land use system since the 1950-ies was carried out gradually, as far as the development of agrochemical and machine building industry took place, and its first period is linked to the ploughing of a significant area of virgin and fallow land, that lead to the transformation of natural landscapes on the subsystem level. In a small time period the sawing area is increased by 2 times and the total ploughing reaches 56,4% of the region. The increase in plowing lot area becomes possible because of the beds and land fund of Demesnia steppe ploughing up without considering soil and relief landscape peculiarities that lead to the intensification of the agro-landscapes ecological situation. The second period started with a wide development of grain-cultivated and grain-steam-cultivated crop rotation. The all-around production of cultivated crops on the ploughed up surface lands lead to the strengthening of the erosion processes, the decrease in humus content on the surface lands and steam fields. The third period is related to the development of the intensive chemicalization and the usage of high mineral fertilizers doses. At this time the phosphatation and nitrification of separate fields and eutrophication of water bodies because of the washout of the fertilizers from fields, takes place.

Within the time of the intensive land use system existence the humus deposits in eroded soils decreased by 32,7%, and the water resistance – by 44%. The steepness of surface (up to 10-15 °),

suffosive processes on these soils had defined the intensive development of the junction and shower erosion. About 4 thousand hectares of poughed fields and 25,4 thousand of natural lands were exposed to water and wind erosion of medium and strong degree.

At the end of the XX-th century the *adaptive-landscape or landscape-ecological land use* starts its advance in the region. It is oriented for the maximum description into nature, the following of its laws, differential and address usage of the territory specificity. The reproduction of the soil fertility in these systems is provided by the cultivation of a wide spectrum of grain-bean and feeding cultures, including one-year and many-years grass.

The major problem of the further address territory usage is the making of the incline corner maps of the research area that are necessary for the calculation of the erosive danger of the separate land use area. Also the making of the soil-landscape husbandries maps with the outlining of the areas, tracts, and factions for the implementation of complex soil analysis of the modern land usage condition and the development of the necessary measures.

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Materials of Conferences

**AGENCY OF PHENIBUTUM
ON PARAMETRES OF
AN ENGLOBEMENT OF RATS
OF LINE WISTAR ON MODELS
OF THE EXPERIMENTAL
DEPRESSION**

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The variety of the clinical displays of depressive disturbances, the multiplicity of the different groups of antidepressants molecular impact mechanisms testify the participation of the linked disturbances of neurochemical systems in a depression pathogenesis. The study of the neuroimmune mechanisms of the depression development and the search for the correction means is one of the main directions of the psychoneuroimmunopathology development. We carried out an experimental research of the phenibute and phagocytal immune link impact on the experimental depression models. A pathological condition of the Wistar line male rats was formed under the conditions of emotional stress. As a result aggressors and victims with a daily experience of wins and losses were outlined within 20 intermale confrontations. Intact males that were placed separately in the same cells for 5 days and received intra-abdominal injections of physiological solution were used as a control №1. The rats with an experimental depression model that received intra-abdominal injections of physiological solution were involved in the control group №2. The research group was presented by the depressed animals that received intra-abdominal injection of phenibute in a dose of 25 ml/kg within 10 days. The study of the phagocytal neutrophil activity was carried out on the latex test basis with the definition of phagocytal number, phagocytal index, and the number of active phagocytes. The phagocytosis percent as well as the phagocytal number rose within the depressed animals (both aggressors and victims) in comparison with the control №1. However, the absolute number of the phagocytting neutrophils within the aggressors decreased while the increase in this index was registered within the victims. The phenibute had a

corrective impact on a non-specific immunity link within the research group animals: the phagocytic number and index decreased both within the aggressors and victims and approached the "normal" animals (control №1) phagocytic parameters, and the number of active phagocytes tended to increase within the aggressors and decrease within the victims. The results allow us to conclude that phenibute is able to remove the disturbances of non-specific resistance that appear under the depressive conditions.

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**ACID-BASIC CONDITION OF BLOOD
AS THE INDICATOR
OF EFFECTIVENESS OF USE
AT THE RATION OF BIRD
THE NATURAL POLYMINERAL
ADDITION**

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The abnormalities of acid-basic condition (ABC) of the agricultural bird while the anthropogenic loads, high productiveness, discrepancy to the standards of conditions of keeping and feeding become the reason of abnormality of physiological functions.

The aim of research – to assess the effectiveness of use of polimineral addition (PMA) Ecos from the natural hydro aluminum silicate of the deposits of Belgorod region at the feeding of bird [1], using as the integral showing its physiological prosperity and adaptation to the conditions of feeding the acid-basic condition of blood (ABC).

Methodic

The researches at ducklings of meat directions of cross Medeo were carried out in conditions of vivarium of Belgorod state university; scientifically-producing experience at the ducklings-boil-

ers of cross ISA was carried out at the bird complex «Yasnozorski» of Belgorod region. By the principles of par-analogues with the taking into consideration of mass of the body and clinical condition there were formed experimental and control groups. The bird of control group received only basic ration (BR), experimental – in addition to BR – PMD at the optimal dose: $100 \text{ mg} \cdot \text{kg}^{-1}$ of mass of the body for ducklings and chicken (optimal dose of PMD was defined in the special research). The duration of growth of chicken was 49 ducklings – 60 twenty-four-hours. There were taken into consideration the general clinical condition, density of feathering, dynamics of mass of the body, and also average daily increase, eaten feed and safety of bird. There were defined: the active reaction of blood (pH_{act}) by ionomer (Mettler-Toledo, Switzerland, 2000); bicarbonates of plasma (IB) by diffusive method; buffer bases of plasma (BB), standard bicarbonates (SB), displacement of buffer bases (DBB), partial pressure of carbonic acid (pCO_2) in the blood by the method of Astrup in modification O. Ziggard-Andersen by nomograms; erythrocytes were calculated at the camera of Goryaev; hemoglobin was defined by hemigloinecyanide method.

Results

While the comparison of showings of ABC of 30- and 60-days old ducklings of control groups 30-days old ducklings had metabolic acidosis, which was supported by low means of значения pH_{act} , deficit of BB and SB in blood correspondingly to 17,0 and 17,1% ($p < 0,05$), which were defined by high energy of growth of bird while the insufficient formed mechanisms of homeostatic regulation. The displacement of parameters of ABC at the experimental group was less revealed: SB was $20,2 \pm 1,6 \text{ milimole} \cdot \text{l}^{-1}$ against $18,6 \pm 1,3 \text{ milimole} \cdot \text{l}^{-1}$ in control, and DBB was higher to 11,5% ($p < 0,05$). The more high means of pCO_2 promoted the keeping of pH_{act} in the limits of physiological norm ($7,42 \pm 0,02$) and initiated the respiratory regulative mechanisms. 60-days old ducklings (of control and experimental groups) there was observed the balance of ABC, and all the parameters that characterize it were at the limits of physiological norm.

Ducklings, who received with fed the PMD, had the observed acidosis of metabolic nature at the subcompensated phase. The high productiveness of bird was predetermined by intensive metabolism, high oxygen request and considerable displacement ABC of blood. At the experimental groups of birds the changes of its pa-

rameters, which reflect the acid-basic homeostasis, were minimal, what is confirmed by the level of BB of blood – of the experimental bird it to the 6,6% higher than it is of control one ($p < 0,05$). The acidosis condition of blood of experimental chicken is compensated by rather strong, than it is of control, buffer systems: the concentration of SB is higher to 17,5% ($p < 0,05$).

According to existing opinion, one of the mechanisms of compensation and adaptation at the system of acid-basic homeostasis – the increase of transport of oxygen to the tissues and full oxidation of accumulated metabolites [2]. PMD Ecos, having hematopoietic effect, carries out this process at the full measure: regulation and quantitative strategies of adaptation promote the increase of erythrocytes in the blood, and also general hemoglobin and at the separate erythrocyte and oxygen capacity of blood of ducklings and chicken correspondingly to 12,0 and 52,6%; 7,1 and 18,7%; 13,4 and 19,3%; 7,2 and 18,5% ($p < 0,05$) [3].

Thereby, the inclusion of polimineral addition to the ration of feeding of birds promotes the forming of strong buffer systems, the most full compensation of displacement at the acid-basic condition of blood, and positively influence the physiological condition, initiates the growth and development, rises productiveness and dietary value of meat [4].

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*Materials of Conferences***ABOUT INTEGRATION
OF EDUCATIONAL STANDARDS ON
PALEONTOLOGY, STRATIGRAPHY,
SEDIMENTOLOGY AND ANALYSIS OF
PETROLIFEROUS PALEOSTRUCTURE**

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Educational standards for students-geologists on paleontology at various universities are close, as have the general basis: paleontological classification of fauna and flora and the characteristic of geological age of fossils. Programs and educational standards are pull together also with the decision of the general theoretical and practical problems: investigation of geological age of rock, conditions of sedimentary rock and a role of fauna and flora in their formation. Important information for studying paleontology in system of geological sciences gives stratigraphy, which orders specimens on stratigraphical scale.

Most part of educational standards for stratigraphy are common for all students-geologists. General stratigraphy are studying history of stratigraphy as fundamental geological science, methodological principles of stratigraphy, studying of the general, regional and local stratigraphical scales, and also studying of methods theoretical stratigraphy and practical receptions of the description of geological sections. Distinctions in requirements to standards and curriculums are caused by features and distinctions of the Global International Stratigraphical Scale (2004) and, national stratigraphical

scales, for example, Eastern European Common Stratigraphical Scale, published in the third edition of Stratigraphical Code of Russia (2006).

Stratigraphical reference points (the general, regional and local) are the fundamental basis for the formulation and the decision of problems of oil geology in a rate of historical tectonics of local petroliferous structures and the analysis of paleostructures. Sedimentology of strata and lateral variability of sedimentary rocks has very important role for investigations of petroliferous paleostructures and for the analysis of paleostructures.

Problems of lithological description of the sedimentary rocks, solved by students-geologists at the Perm University, lean on classical Russian schemes of the description of sedimentary rocks. However in the decision of problems of the oil geology, connected with construction of cards of capacities and cards geological classifications of sedimentary rocks by R.J. Dunham (1962) are even more often used. Tendencies to rapprochement of techniques of the description of sedimentary rocks, their mutual filling and enrichment are outlined in this area. Consequently, the tendency of change and rapprochement of the international educational standards for lithology, sedimentology (analysis of geological facies), related subjects distinctly are recognising.

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Short Reports

THE BLOOD CARBOHYDRATE COMPONENTS, AS THE AUSTRIAN SELECTION SIMMENTALSKY BREED COWS' ORGANISM FUNCTIONING ENERGY RESOURCES UNDER THE SOUTHERN URAL AGROECOSYSTEM CONDITIONS

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The imported cows into Russia adaptation process is being passed rather difficultly under the new economic – ecologically conditions, and it is being needed the considerable, as the metabolic cost, well as the energy expenditure. The anaerobic oxidation processes are being intensified, against the background of the glucose concentration lowering, having accompanied by the lactic acid (LA) concentration rise in 1,76–1,81 time and the carbohydrate index in 1,32 time, in comparison with the domestic selection Simmentalsky breed cows, and, having testified on the imported cows animal's organism energe-provision inside-organ sources mobilization.

Keywords: the adaptation, the aerobic processes, the carbohydrate metabolism.

At present, the dairy cattle number has considerably been decreased in the Russian Federation [1, 4]. In this connection, for the provision purpose of the animals' genetic potential provision, without which it is quite impossible the further breeding progress intensification, the animals import from abroad necessity has been appeared, which, in many scientists, the scholars and the specialists, the experts opinion, initially have got the necessary genetic direction and the orientation for the milk production [2, 3, 5, 6]. At the same time, the imported animals' adaptation process is being passed rather difficultly, and it is being accompanied, in the first place, by the general resistance lowering, and by the metabolic processes disorder, having been one from the factors, which are being prevented from the genetic potential realization of the cows' milk productivity in the new climatic – naturally zones. For all this, it should be noted, that the carbohydrate metabolism is being played specially the significant role in the metabolic processes, as the animal's organism functioning processes are being provided by the energy, the main source of which the glucose is being acted in the tissues.

Having taken into the consideration the whole above – mentioned material, the economic – scientifically experiment has been carried out by us on the basis of the «Yasnye Polyany» OOC of the Troitzk Region, having imported the Austrian selection Simmentalsky breed heifers by the «APC Development» national project program, and the «Novaya Zarya» OOC of the Chesmensky District of the Chelyabinsk Region, having specialized in the same cattle breed, but by the domestic selection. For the experiment setting and the further carrying out, the two cows groups by 10 heads in the each household, having selected by the analogues – pairs principle, have been formed up by us. The I-st group – the Austrian selection Symmentalsky breed cows, the II-nd group – the domestic selection Symmentalsky breed cows. The main indices valuation of the carbohydrate metabolism has been carried out by the generally accepted methods in the veterinary science.

Having taken into the consideration, that it is quite necessary the aerobic processes for the main physiological functions implementation by the animal's organism that is the cell respiration, the carbohydrate metabolism indices, having permitted to be tried on the oxidation processes regime and their correlation in the examined cows' organism have been studied by us.

The results of the carried out researches and the studies have already been showed, the imported cows adaptation to the Southern Ural new ecological and the economic conditions is being needed the considerable, as the metabolic cost, well as the energy expenditure. So, the glucose concentration – the basic energy source for the animal's organism cells – it has been made up $2,10 \pm 0,06$ mmole/l at the imported cows, that for 45,23 % (e.g. $p < 0,01$) has been less, in comparison with the II-nd group cows (e.g. $3,05 \pm 0,04$ mmole/l). So, in our opinion, the set and the fixed changes are being testified to on, that the imported cows adaptation process just to the quite new conditions is being demanded the quite considerable, as the metabolic cost, well as the energy expenditure.

The anaerobic oxidation processes are being intensified, against the background of the glucose concentration lowering, that is confirmed by the pyruvic (PRA) and the lactic (LA) acids concentrations change character. In spite of the fact, that the PRA concentration – the glycolysis and the glyconeogenesis major metabolite – has been found at the $144,52 \pm 2,64$ mkmole/l level (e.g. at its value at the II-nd group cows –

105,12 \pm 1,28 mkmmole/l), and it has been corresponded to the specific standard values, the LA content – the glycolysis final product – in the I-st group cows blood is being increased more considerably and, it, moreover, is being exceeded the control performance indices in 1,76 and 1,81 time, in comparison with the standard, that should have the unfavorable influence upon the physiological functions series passing (e.g. tissue respiration is being inhibited, the blood pH is being changed into the acid medium, the animal's organism host defenses are being lowered). The lactic acid (LA) accumulation is being indicated at the oxygen deficiency in the cells, at which the carbohydrates metabolism is being reformed from the aerobic one into the anaerobic one. And the data on the carbohydrate index, having made up 14,75 at the I-st group animals, the 11,15 – at the II-nd group animals, at the normative value, which is equal to 11,62–12,20, are being testified on the same aspect. For all this, it should be noted, that the formed and the fixed PRA and the LA concentration rise tendency at the Austrian selection cows is being taken its place against the background of the quantitative changes from the monocytes side and the polymorphno-nuclear blood cells, having testified on the oxygen-dependent inhibition metabolism, earlier having revealed by us.

Thus, the carbohydrate metabolism peculiarities and the specific features at the imported cows are being connected with the animal's organ-

ism energo-provision inside-organ sources conditioned mobilization, against the background of the hypoxia and mainly the carbohydrate anaerobic oxidation.

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Short Reports

SOCIALLY-PSYCHOLOGICAL DETERMINANTS PROFESSIONAL COMPETITIONS

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Necessary condition of quality assurance of the maximum vocational training is diagnostics of formation professional competitions in dynamics of training. In this context the estimation of conformity of personal properties of the student critical to requirements of a trade represents an element professionographical prospectation which basic purpose is designing professional growth of the expert on the basis of diagnostics of professional functions. A condition and dynamics of development of individually-typological properties of an individual during training in high school, certainly, it is caused by numerous factors of subjective and objective character. In particular, modernization of the maximum vocational training initiates development of creative and mobile personal qualities.

With the purpose of studying of dynamics socially-psychological descriptions professional competitions we have lead longitudinal research of students of medical high school with 2-nd on 6-th curriculum, general number 512 the person, taken in parity parities. Diagnostics of a condition of motivational sphere it was spent by a technique of an estimation of need for achievement.

According to the received results average value of parameters of motivation of achievement of students during all time of training corresponds to gradation «average» ($12,35 \pm 2,06$). It corresponds also to data of the distributive analysis – at the majority of students (from 63,7% on 3 rate up to 70,2% on 6 rate) parameters of a considered attribute of an average level are noted. High levels of motivation during all period of training in high school are registered on the average at 5-10% of students. At students-young men dynamics of a considered parameter consisting decrease of number of persons with a low level of motivation and increase of persons with an average level ($p < 0,01$) is observed. At students-girls the tendency to decrease in persons with average indices and to increase – with low ($> 0,05$) is opposite marked. Observable dynamics of parameters of motivation of young men positively characterizes process of

formation of creative qualities. The tendency level of motivation of girls, probably, is connected with new social functions or girls expectations (formation of family, a birth or expectation of children).

Pays attention, that practically 30% surveyed during all training in high school had parameters of motivation of gradation « a low level » which can be regarded as a risk factor for development creative socially-significant professional competitions at this part of students. Besides the low level of motivation complicates process of reception of a professional knowledge and purchases practical skills, and, hence, complicates social-professional adaptation on beforedegree stages.

The level of development of motivation of students, certainly, has influence on formation in the future of the social status of the expert, defining realization of the mobile and creative properties used for an estimation of its is professional-psychological potential.

The analysis of the received results allows to define actions of psychology-pedagogical support of vocational training during training in the high school, directed on duly diagnostics and correction of a low level of development socially-psychological competitions of students.

FROM VIRTUAL CHARACTER TO VIRTUAL EXISTENCE

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The article discusses the notion of a virtual personality, touches upon the development and essentials of a virtual existence of a person. The notion of a virtual character is analyzed from the epistemic point of view.

Virtual reality is a multidimensional factorial structure, which influences a real personality in a way that leads to its considerable transformations. Reconstructing the social transformations of a personality, we should address such notions as «virtual personality» and «virtual character».

Definition of the virtual personality is based on the interpretation of the «personality in personality», which forms under the influence of the virtual reality, and provides effective interaction and psychological comfort to a person acting in the virtual world. The unity of the virtual and real personality in social and virtual worlds leads to the so called bilateral personality virtualization, based on the interaction of two personality components resulting in existence of the virtual personality.

As a derivative of the virtual reality, and a product of technical embodiment of information system development and human conscious, the virtual personality, though having certain characteristics of a subject (for example, relatively autonomous actions in the virtual world), remains symbolic and immaterial, non-trivial, with multi-dimensional consequences, at the same time, preserving its nominal meaning. These characteristics determine the virtual personality as an object in relation to the real personality. Having influential properties of an objective subject of activities and relations, the virtual personality influences the mind of a real subject massively, which often leads to personality deformations.

Speaking about the virtual personality, one should not forget that its virtual existence is based on the creation of a virtual character. Term «character» is being used to describe the result of subject's cognitive activity. By using the term one instinctively means the content of an object reflected by the character. From the epistemic point of view, the objective content of character could be described with the help of the following characteristics: structural, quantitative, qualitative, axiological, as well as by analyzing the structural and semantic relation between the character and the original.

The structural evaluation is based on the method regarding every study object as a whole system, consisting of interdependent components, which interact with each other and the environment, are integral, have an well organized stable structure, and exist autonomously in the environment. Scientific understanding of such system requires to learn the variety of its links and structures.

The quantitative characteristics allow to explain the properties and structure of the objects being perceived, using the data about the represented objects. Data necessary for such analyses are obtained in an empiric way, by means of direct and indirect measurements and estimation of intensity of the mentioned properties and existing interactions.

In the qualitative aspect, the character is determined by heterogeneity and insufficiency of the representation at the level of integral images of subjective perception, sensual and theoretical cognition of the variety in the Universe.

The axiological evaluation of character is possible through determination of the subjective value of the character for the person. As a product of mental activity and focus, the character is related to some of person's needs and thus gains for him a certain importance.

Analysis of the **structural relation between the original and the character** reveals the correspondence and similarity of the represented character and original, i.e. transition from character to original. While comparing the structure of the character with this of the original one discovers the nature of their interdependence. This is what the concept of the epistemic image means.

The semantic aspect: the semantic function of virtual character is an ability of reverse projection of the image structure on the original. It distinguishes two modifications of the studied character: mental and sensual. The sensual image is based on the objectivity of our senses. It means that subject possesses not only the states of his sense organs, but also the reflected properties of things, which he then compares.

The mental image has a feature similar to the objectivity of the sensual image – its meaning and importance. Empirically and theoretically, the definition of character's meaning and importance can be interpreted as follows:

1. Compare the structure embodied in the character or in a notion with the types of empiric objects.
2. Compare the structure of a system content or an abstract notion with another, better studied class of systems or notions.

The above studied relations between the notions of virtual personality and virtual character, as well as image and character, let go deep into the matter and understand the internal mechanisms of formation and existence of the virtual personality.

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Short Reports

THE USE OF INFORMATION AND COMMUNICATIVE TECHNOLOGIES AT THE ECONOMICAL AND CULTURAL SPHERES IN RUSSIAN FEDERATION

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In the article there is analyzed growing influence of informatization on the economy and culture in Russia. There are brought corresponding statistic facts.

Present time is characterized by the rapid growth of using the technical means at the sphere of exchange and treatment of information. Infor-

mative-communicative technologies become an integral part of production and social processes, act as an instrument and object of cultural and philosophical analysis. One can speak about «virtualization of reality». Wide use of computer technique, informative innovations, global and local nets have changed the form and regime of many organizations and presented new possibilities to the realization of economical activity and cultural exchange.

The use of personal computers in Russian Federation in 2008 was 32 on 100 men against 29 in 2007, 26 in 2006, 23 in 2005. The number of organizations, which used informative-communicative technologies for organization of sites in Russian Federation was 22348 in 2005 year, 33626 in 2007 year and 38812 in 2008 year [1].

The use of informative technologies at industrial and economical sphere allows enterprises to reach the advantages in the competitive strife at the expense of rise of effectiveness of the enterprises' work, lowering of temporal costs to the carrying out of defined operations, decrease of volume of paper circulation of documents. The use of special programs is revealed at the table 1.

Table 1

Number of organizations, which used special program means

	Editorial publishing systems	Educational programs	Antivirus programs	CRM	ERP	SCM	Other
RF	8979	28310	121612	5346	6081	1793	69094

Thereby, the necessity of using the informational technologies and systems is obvious.

In the cultural sphere informatization has led to the lowering of interest to libraries-

sand establishments of cultural-leisure type, but hasn't influenced publishing activity [2]. These statistic facts are obviously presented in the Table 2.

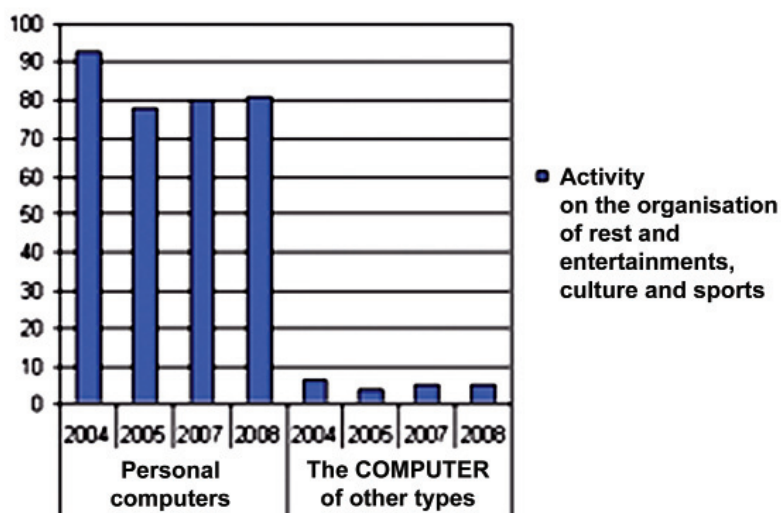
Table 2

The dynamic of condition of cultural activity and establishments of culture in Russia

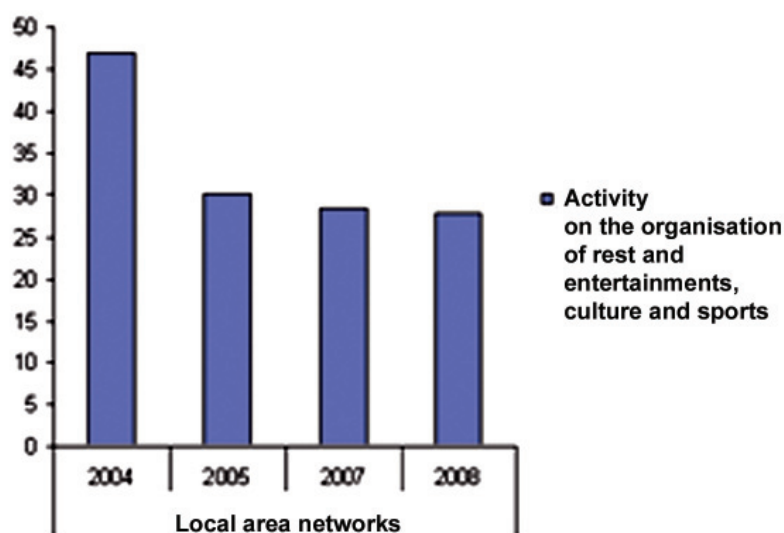
	2000	2003	2004	2005	2006	2007	2008
Public libraries, thousands	51,2	-	49,9	49,5	48,3	47,5	47
Number of professional theaters	547	568	579	588	590	594	586
Museums	2047	2229	2269	2285	2368	2468	2495
Establishments of cultural leisure type	54,8	53,6	52,9	51,4	49,5	49,5	48,4
Publishing activity:							
books and brochures (printing units), thousands	59,5	81	89,1	95,5	102,3	108,8	123,3
magazines and periodical publications	3570	4551	4674	4874	5429	6312	6698
Number of journals	5758	8086	7517	7535	8250	8516	8978

By the facts of Federal service of state statistic [4] at the sphere of culture and sport, rest and entertainment the use of computers, other types of electronically-calculation

technique, computer nets decreases in comparison with 2004 year, but there is positive dynamics from 2005 till 2008 years. (Picture 1; Picture 2)



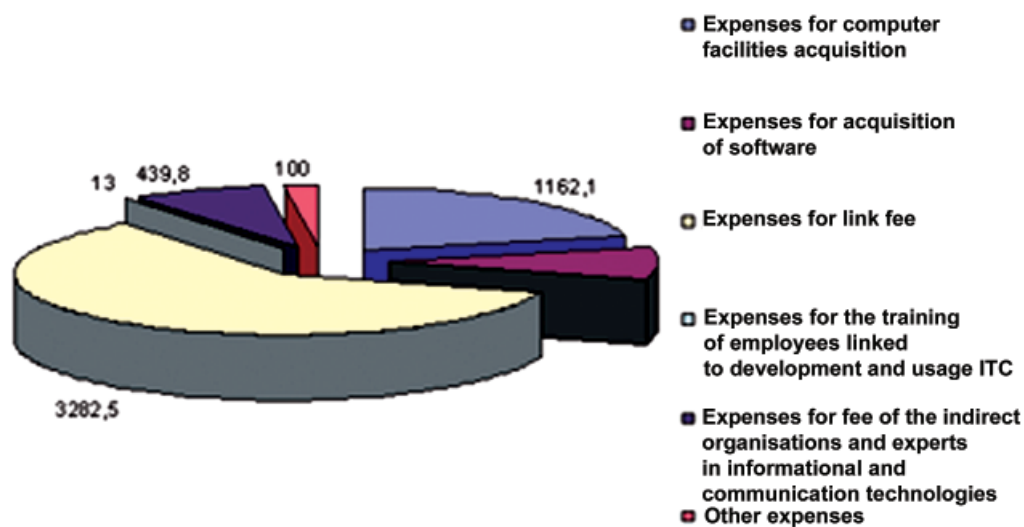
Pic. 1. Number of organizations, which used calculation technique (in percents from the whole number of examined organizations of these types of activity)



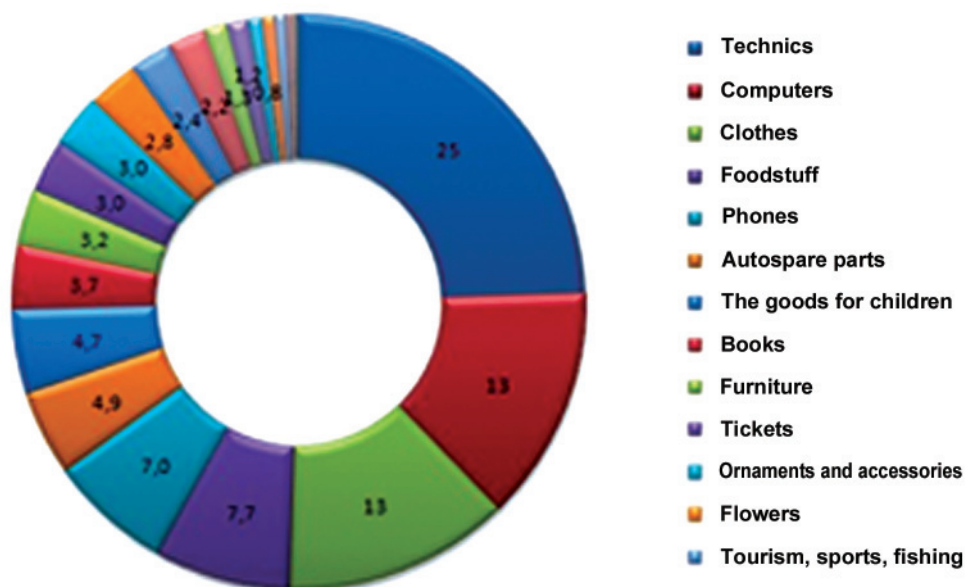
Pic. 2 The use of local nets

At the structure of costs on the informative and communicative technologies at the sphere of organization of rest and entertainment, culture and sport the biggest part is occupied by costs on

the payment of communication services, in which there are included costs on the payment of access to the network Internet at the rate of 514 millions of rubles (Picture 3)



Pic. 3. The costs on the informative and communicative technologies at the sphere of organization of rest and entertainment culture and sport (millions of rubles)



Pic. 4. Circulation in milliards of rubles in year calculation

At the economical sphere the use of informative technologies and systems is rather wide. One of the directions is electronic business and electronic commerce. At the picture 4 there is presented the structure of market of electronic commerce by different goods categories in 2009 year [4].

Modern direction of using the informative technologies in culture is visualization or rendering that means the process of getting the image by the model with the help of computer program, which is comparable with the idea of visualization. In conditions of extensive use of internet-technologies there is sharply stand the question of net culture.

Thereby, in Russian society the informative and communicative technologies are actively used at the spheres of economy and culture. There is realized the importance of their use, development,

there is increased the number of organizations, which use different types of informative-calculation technique and computer networks.

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