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## THE SAKHALIN REGION NATURE AND ITS INFLUENCE UPON THE ELDERLY PEOPLE'S HEALTH

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The Sakhalin region climatic – natural factors are quite able negatively to make their influence upon the human organism, especially of the elderly and the senior ages. The human organism normal vital functions and the life activity maintenance, in a case of the environment unfavorable factors long – term effect, is being needed in the additional physiological resources expenditure and their consumption, that is being resulted in the physiological mechanisms overstrain, in the pathological processes development, and also in their chronization. The elderly people are usually being characterized by the defined and the specified physiological peculiarities and the special features, which are quite able to be progressed much quickly under the unfavorable influence and the impact, having caused the accelerated ageing, the multiple chronic diseases and the illnesses, and also the earlier and the immature death.

It has also been revealed, that in connection with the prolonged adaptation of the long duration, the ageing accelerated type is being formed at the elderly people, which is being evident and is being declared itself in the expected life duration decrease for 1, 0 9 time, in total mortality increase in 1,09 time, for all this, the men death rate is higher, than the women death rate in 1, 34 time.

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### Introduction

The Northern territories are being characterized by the original and the peculiar natural factors unfavorable complex. The Sakhalin region is being equal to the Northern territories. The climatic – natural conditions complexity, the ecological «fragility», the economy structure one – sidedness, having based on, basically, the non – renewable natural resources extraction and the following processing, the public health insufficient maturity and the development – all these and the other factors are usually being made an influence upon the demographical processes and the residential population health state, especially, of the socially inactive – elderly and the senior people [1, 2]. On the whole, the Sakhalin region climate is quite possible to be characterized, as the monsoon climate of the moderate latitudes [3]. The circulation processes seasonal change is the most character and the typical one in the atmosphere for it, having appeared under the high atmospheric pressure influence just over the Euro – Asian continent in the winter and also over the Pacific Ocean in the summer. The water surface, having accumulated the solar energy warming during the whole summer, is being promoted the cold air mass heating, having entered from the North and also from the North – West directions. The seas and the water surfaces cooling down influence is be-

ing affected, indeed, during the whole summer, especially of the colder Sea of Okhotsk. The water temperature in the Sea of Okhotsk is being left quite the very low one even in August. The water temperature is only equal to 5.6° C in the Western sea coast region of the Big Kuril Range Islands, where the deep – sea and the depth waters are being risen up to the surface. The sea cooling down is being revealed during the winter and just in the beginning of the summer and also in the fact, that the internal valleys are being warmed up much better, than the coastal regions. During the fall it is being taken its place just on the contrary: it is much warmer on the seashores, and it is much colder in the valleys [4]. The shifts, having made in the human organism by the weather – forming factors oscillations, will be defined, first of all, by their changeability degree, and also by the human organism state, by his compensatory reactions degree of the stability [3]. The human health formation ecological regularities and his disorders are being had the more and more significance, in the connection with the continuous process of the dependence consideration in the «man – natural environment» system [4,5,6,7]. The human organism accommodation and the adaptation to the inadequate external influences are being accompanied by the physiological systems reliability decrease, and it quite often is being reached at

the price of the considerable, as morphological, well as physiological shifts, having entered just into the pathology region. The sufficient large number of the experimental and the clinical data have already been stored to the present time, having confirmed the given theory [6,8,9]. The processes insufficiency connection of the tissues biochemical regeneration, the anabolic and the reparative reactions activity decrease, the atrophy development with the ageing signs and the indications manifestation, which is being revealed in «the defecto – reparative correlations» have been registered by many researchers [10,11]. And this phenomenon is being connected with the entropy. In his time, Hompertz has still paid his attention upon the death rate and the entropy age – related change curves likeness, the formula of which is being characterized the ageing processes essence, as the entropy accumulation in the biological systems [12]. Consequently, the «payment» processes are being developed for the long – term accommodation and the adaptation for the environment unfavorable factors prolonged influence, which, in the real situation, are being functioned in the complex. And they have been presented in the following manner [7]: the social activity and the work – efficiency decrease; the predisposition formation to the various diseases and the different illnesses; the advent and the appearance elevation of the acute attack and the exacerbation of the chronic diseases and the illnesses; the human organism premature ageing; the indices decrease of the average life duration; the health state aggravation of the next generations. So, the state on the ageing syndromes has been formulated by the scientists and the scholars [13,14]. They are being characterized by the more expressed manifestations from the side of that or another system: the neurogenetic, the endocrine, the hemodynamic ones and the others. The syndromes are being especially significant and important, having singled out by the ageing rate e.g. the accelerated and the delayed ones. The accelerated ageing, having characterized for the people aggregation,

having lived in the Sakhalin region, which has been considered by us, is being named the age of return. It is the basis for the early development or the prematurity of the age – related pathology (e.g. the atherosclerosis, the ischemic heart disease, the cancer, the diabetes and etc.), and, ipso facto, it is one of the leading reasons of the life shortening.

#### **Discussion**

First of all, it is necessary to consider the elderly and the senior part of the people, at the ageing consideration, who are at the defined and the specified people aggregation level, having lived on the defined and the specified territory. The part of the people, having lived in the Sakhalin region, is older of the working age, has been made up 15,8 % at the end of the 2005 year. So, it is the same, as in the urban, well as in the countryside. For all this, the men have been made up 25,2 %, the women – 74,8 % among the townspeople, who are older the working age. But among the villagers, it has been made, correspondingly, – 26, 7 % and 73, 3 %. The Sakhalin region is being occupied the fourth place after the Republic of Sakha (Yakutsk), the Magadan and the Kamchatka regions by the population growth rates, who are older the working age. The country population is being considered the old one, in the case, if the part of the people has been made up at the age of 65 years, and it has been exceeded the older age for 7 %, according to the international criteria. The Sakhalin region population has already been passed into the old ones category, as far as back, in 1997 year, as the elderly and the senior population specific ratio has been reached 7,1 %. The senior age citizens' population growth in the Far Eastern region, on the whole, and in the Sakhalin region, in particular, is being proceeded on with the more slow rates, than, in the average, in the Russia. The population in the Far East is much younger, than, in the average, in the Russia, but in the Sakhalin region – is much younger, than, in the average, in the Far East. So, in the 2005 year, the elderly and the senior age persons share has been made up 9,4 % in the Far East region, on the

whole, by the Russia it has been made up – 13,9 %, in the Sakhalin region it has been made up – 8,8 %. The lesser part is the elderly and the senior ages' population, in comparison with the averages indicators and the indices by the Russia, by all the regions, having related to the Extreme North regions and also having equated to them territories. At the same time, we suppose, that this phenomenon is, mainly, being explained by the fact, that in the Soviet period the state's social and economic policy has been directed to the people attraction and the involvement, who are capable of their working to these regions, and these people, to the retirement age achievement time, have had their possibility to provide themselves with the accommodation just in the favorable for the life regions, and then they simply have left the North with the retirement age achievement. That is why, such removal for the overwhelming majority of the elderly, the senior, and the old people has been become the most problematic challenge with the market relations transition. By the Russian Statistical Data forecasts, to the 2025 year, the population part, which is older the age capable of the working, will be increased, in our region, up to 21,7 %, the population part, which is older 65 years, will be made up in the 2015 year – 9,4 %, but in the 2025 year, it will be made up – 12,5 %. The ageing indicators and the signs dynamics for the elderly and the senior ages is the following: the life expectancy (LET) and the mortality and the death rate have had the following tendency. The LET index has been decreased from 0,649 down to 0,593 for the period from 2000 till 2005 year. For all this, in the 2000 year, the women and the men life expectancy indices have been made up 0,763 and 0,558, and, in the 2000 year, they have been made up – 0,718 and 0,491, correspondingly. Having judged from the men life expectancy (MLET) indices values, it should be related to the unsatisfactory group, as in comparison with the women life expectancy (WLET), their LET is quite less in 1,4 time. By the scientists and the scholars forecasts, the LET index decrease and its transition just

into the unsatisfactory group, it will be able to be brought in 20 years to the fact, that the men life expectancy (MLET) is quite possible to be decreased down to 50 years in the Far East regions, if the region social and the economic development realization is being proceed by the pessimistic scenario.

Thus, it is quite well – known, that the LET indicators and the signs are being usually depended on many factors, but, especially, on the social and the economic ones. Such scientists and the scholars, and also the doctors, as A.P. Dobroslavin, E.A. Osipov, V.O. Portugalov, and F.F. Arisman have already indicated and mentioned on this phenomenon in the end of the 19–th and in the beginning of the 20–th centuries [15]. That is why, the LET sharp decrease in the Sakhalin region – is the life socio and the economic conditions worsening consequence in the region. The transition to the new economic conditions just in the region (e.g. of the market economy) has been resulted in the fact, that the overwhelming majority of the people have experienced the whole shock from the fact, that the state is not being worked, as it has been before, having controlled the man's human living cycle from the birth up to the death. Such social diseases and the illnesses, as the misery and the poverty have been, intensively, flourished and blossomed in the society, the consequence of which the mortality and the death rate have been increased, especially at the persons with their low social activity. So, the elderly and the senior people, having been in their overwhelming majority the socially inactive ones, with the diseases and the illnesses whole complex, so they are not quite able, completely, to satisfy their needs, that is being resulted in the fact that many from them, practically, do not want to live for the long time. So, the mortality and the death rates indices (such as, GDI, MDI, WDI) of the general, the men, and the women ones are, constantly, being raised in the side of the further increase. Thus, for the period from the 2000 till the 2005 – es, the general mortality and the death rate index have been made up 4,667 and 5,097, that is,



it has been raised for one unit. That is why, it has been registered, that the men mortality and the death rates indices are being exceeded the women mortality and the death rates indices at the ages from 65 – 69 years from 2,3 times up to 2,7 times, and at the age of 70 and also more years from 1,4 time up to 1,5 time for the researched period of the time. So, the mortality and the death rates indices are being connected, as with the human organism internal adaptive possibilities, well as with the external factors. This is being promoted to the quite unfavorable climate influences and the impacts, the environmental pollution and the following contamination, the high level background radiation, the elderly and the senior people low social possibilities, as all of them are the pensioners and, mainly, they are the invalids, without their possibility of the sufficiently qualitative medical treatment and the Sakhalin region outside and beyond the borders departure. So, the main death rates reasons at the age of the older population, capable of their working are the blood circulation system diseases, the neoplasms, and the tumors illnesses, the accidents and the casualties, and in the less degree – the respiratory and the digestive organs. By the Russian Statistical data, it has been revealed, that the 67,7 % men and the 73,9 % women of the elderly and the senior age have died from the blood circulation system diseases and the illnesses in the 2005 year. In the 2005 year, the 15,8 % men and the 11,8 % women have died from the neoplasms, and the tumors diseases and the illnesses, the 6,5% men and the 4,3 % women have died from the accidents and the casualties, and, correspondingly, the 2,8 % men and the 1,9 % women from the respiratory organs diseases and the illnesses, and the 4,2 % men and the 4,3 % women from the digestive organs diseases and the illnesses. In the 2000 year, the men mortality and the death rate at the age of 65 - 69 years has been made up from 70,9 %, and then it has been raised up to 86,2 % in the 2005 year, and it, moreover, has been exceeded the women mortality and the death rate just in 2,2 and 2,7 times. The

men mortality and the death rate exceeding has been made up 1,4 – 1,5 time at the age of 70 and more years. The population mortality and the death rate is the country people ageing consequence. It has already been statistically revealed, that in the 2005 year, the elderly and senior age people, having had the necessity to be addressed to the medical Institution and the corresponding Establishment, and not having addressed, because of their impossibility to pay for the necessary medical services, have been made up 61,3 % from them 12,4 % – have been the men, and 48,9% have been the women, that it has been conditioned by the population's low money income: that is the incomes, which are lower the living age and the minimum of the subsistence at the 102,2 thousand people (e.g. 19,3 %).

#### **Conclusion**

The elderly, the senior and the old people specific ratio, having lived in the Sakhalin region for the 2005 year, has been made up 8,8 %, and it, moreover, is being proceeded to be increased.

The ageing accelerated type is being formulated at the elderly and the senior people in the connection with the long – term lasting adaptation, which is being revealed at the expected life span decrease for the 1,09 time, in the general mortality and the death rate increase in the 1,09 time, for all this, the men mortality and the death rate is being much higher, than at the women mortality and the death rate in the 1,34 time.

Therefore, having taken into the consideration the region environmental discomfort climatic – natural factors, which, doubtless, have the very high significance at the prolonged living and the residence, the continuous social and the economic conditions worsening, the negative tendencies of the elderly and the senior population health state dynamics, the environmental pollution and the following contamination. Thus, they all together are being brought the considerable contribution into the life span shortening and the reducing of the life, into the elderly and the senior people morbidity, the death rate,

and the sickness rate growth and the following rise.

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*Materials of Conferences*

**STRUCTURE OF PROGRAM-CONTROLLED BIOTECHNICAL SYSTEM OF ULTRASONIC THERAPY THE PARODONTOSIS**

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**Research applicability**

It is known that ultrasonic therapy with therapeutic frequency 1 MHz is widespread used for treatment of many chronic diseases, including gingivae. Ultrasonic decreases algesia and exasperates microcirculation, corrects metabolic disturbance in tissues [3,4,5,6,7,8]. Last years low-frequency ultrasonic is used along with high-frequency ultrasonic in medical practice. In physical medicine low-frequency ultrasonic is usually carried on two frequencies: 22 and 44 kHz while treating ENT-diseases [2,9,10,11]. In comparison to high-frequency, low-frequency ultrasonic gets into tissues deeper, has more antiedematous apparent antibonding and depolymerizing action, changes more vascular and epithelial permeability, shows more phoretic activity [9].

Medications like "Barvinok", "Tanzillor", "Stomaton-1" are used for low-frequency ultrasonic therapy. All these medications do not work in biocontrolled mode [2].

Bio-controlled low-frequency ultrasonic treatment methods are also used for treatment of parodontium tissues [13, 14].

Bio-controlled interferential therapy is also used for parodontosis treatment [10].

We should also mark, that there's no information pointing the necessity of carrying out any complex research about program-controlled methods of ultrasonic current biostimulation either in Russian or foreign references.

To sum up what has been said we should mark that while developing biotechnical systems of ultrasonic therapy, it is important to find solutions providing synchronic biomodulation of mechanical vibrations in tissues together with program-controlled ways of its realization.

The research is done in accordance with task group plans about chronobiology and chronomedicine in RAMS, and also with scientific line of the department under specialty 05.13.01: "Development of universal methods of chronodiagnosis and biocontrol on the basis of biocyclic models and algorithms using parameters of biological feedback" and prevention and disease treatment special program "Health" and development of material-technical base of healthcare in Belgorod region.

**Research aim and objects**

Development of biocontrol system approaches aimed at individualization and enhancing the efficiency of treatment of phlogistic and dystrophic dis-

eases of gingivae by programmed biosynchronization and biocontrol with the help of ultrasonic action.

To reach the desired goal we should complete the following tasks:

- to make a reappraisal of perspective directions, connected with enhancing the efficiency of non-pharmacological remedial measures by using technical biocontrolled means;

- to form biocycled program-controlled models of current impulse patterns, which provide the fixed spectrum of ultrasonic vibrations in the form of influence programs aimed at treatment of acute, subacute, chronic onset of gingivae diseases;

- to develop a structure of program-controlled module of ultrasonic therapy biotechnical system aimed at treatment of acute, subacute, chronic onset of gingivae diseases.

**Materials and research methods**

In accordance with the fixed goals, we have developed a program-controlled device for biocontrolled ultrasonic signal generation. This biotechnical system includes pulse transformer, breath transformer, microcontroller. The device also consists of analog-to-digit converter (ADC) and digit-to-analog converter (DAC), polarity transformer and ultrasonic radiation head.

The device is energized from five successively connected accumulators, strain from which comes to a voltage converter block. Strain +5 V, -5V is formed in it – for operating amplifier and other active system elements energizing and also reference potential 4,096 V for correct analog-to-digit conversion.

Sample ultrasonic signal in the form of impulse currents with frequency about 1 MHz, modulated by signals of low-frequency 7-13 Hz is generated in digital form with regard of fixed in microcontroller ROM program realized algorithms.

Incoming analog signals of pulse and breath are digitized in microcontroller ADC and are added with sampled, modulated ones by low-frequency 7-13 Hz, ultrasonic impulse signals frequency 1 MHz. By means of DAC digital total signal is transformed into analog unipolar with capacity 12 bits, and in signal polarity converter it becomes analog bipolar. The required polarity of output strain up to 15 V is a program set by function key block 8. The signal is cleared from hindrance in a filter and goes to ultrasonic radiator head.

Biocontrolled device of ultrasonic signal generation, by means of special program in microcontroller ROM, allows cycle functioning, including cycle interval in 360 ticks of the blood. Duration of the work includes 300 ticks of the blood and a pause duration is 60 ticks of the blood. The quantity of cycle repeats is set depending on procedure duration: 1-6 repeats (5-30 biological minutes). In this case calculation of set quantity of ticks of the blood is done in a variable which is preliminarily set to zero. Alike cycle func-

tioning duration is due to synthesis periodicity of information RNA, necessary for amino acid elongation at ribosomes.

Biological feedback includes breath, cardiovascular system, breath and pulse detector, and microcontroller with ADC, DAC, signal polarity converter and ultrasonic radiator.

Biocontrol with the help of an influence change of ultrasonic impulse currents is in cycle strain vibrations on the ultrasonic radiator (piezocrystal), created by a summed signal of pulse and breath. These low-frequency cycle vibrations of pulse and breath are added to impulse, modulated LF, ultrasonic signal. In a moment of systole and inhale impulse amplitude is the biggest, and in the moment of diastole and exhale is the least. Shape of such kind of impulses are like modulated waves, which have a shape of a spindle from three to five seconds while normal breath and to ten seconds while resonance breath.

Analyzing the results, we came to a conclusion about necessary realization of three modes of action:

$$t_{y3u.inhale} = \begin{cases} 0,02 + n \cdot P(T, N), & \text{when } R = 1 \\ T - 0,02 - n \cdot P(T, N), & \text{when } R = 2 \\ T / 3, & \text{when } R = 3 \end{cases} \quad t_{y3u.exhale} = \begin{cases} T - 0,02 - n \cdot P(T, N), & \text{when } R = 1 \\ 0,02 + n \cdot P(T, N), & \text{when } R = 2 \\ T / 3 & \text{when } R = 3 \end{cases}$$

where  $R$ - is influence time;  $T$ -is influence impulse period;  $n$  – number of tick of the blood in a breath cycle;  $P$  –excess to impulse duration, depending on influence period ( $T$ ) and number of ticks of the blood, which fall on breath cycle fase ( $N$ ).

### Conclusions

1. There are formed deterministic models of patterns, which provide the fixed spectrum of ultrasonic vibrations in the form of influence programs aimed at treatment of acute, subacute, chronic onset of mucosa gingivae diseases and distinct by program-controlled way of biostimulation of low-frequency electrical beats in parodontosis tissues.

2. A structure of a program-controlled biotechnical system of ultrasonic therapy, characterized by modularity and suitable for mucosa gingivae diseases treatment, distinct by cycle functioning of work and pause mode change with biological seconds counting.

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paradontium vessel edema, microcirculation weakening in an arterial part of capillary bed and without visible defects.

If we introduce concept *impulse filling coefficient* ( $K3$ ), reflecting percentage of ultrasonic impulse presentation time from period  $K3=(t_{y3u}/t) * 100$ , where  $t_{y3u}$  – is ultrasonic impulse presentation time,  $T$ - impulse period, then depending on the influence mode it's necessary to realize the following algorithms: 1) in case of paradontium vessel edema we should reduce the filling coefficient during inhale and increase it during exhale; 2) in case of microcirculation weakening in an arterial part of capillary bed we should increase the filling coefficient during inhale and reduce it during exhale synchronously with the ticks of the blood; 3) without visible defects impulse filling coefficient should be about 33%. Ultrasonic impulse duration during inhale and exhale is defined from the following correlation:

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#### UREAPLASMAS AUTODEFENSE AND RATIONAL ANTIBIOTIC THERAPY

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At present, the great number of schemes and the preparations are being existed, having used at the urogenital ureaplasmosis medical treatment, but the majority efficiency from them is being left at the low level, and, that is why, the adequate therapy search is also being left rather actual.

##### Main Target

It is necessary to study the ureaplasmas sensitivity spectrum to the most accessible and the widely – used antibiotics at the practice, for the purpose of medical treatment efficiency rising of the urogenital ureaplasmosis.

##### Materials and Methods

64 women have been examined with the urogenital ureaplasmosis. Finally, the diagnosis has been completely confirmed by the clinical and laboratory methods.

The Omsk Scientific and Research Institute (SRI) media of the natural and focal infections have

already been used for the ureaplasmas identification. The sensitivity determination for the antibiotics has been carried out at the ureaplasmas exposure in the titer, which is more than 10,000 ESR. So, the ureaplasmas sensitivity for the antibiotics has been determined by means of the «Ureaplasma –АЧ» and «Microplasma – АЧ» test – systems (the city of Saint – Petersburg).

##### Findings of the Investigation

The ureaplasmas have been appeared to be much steady to the tetracycline in 53,1% (e.g. 34 strains) and have been sensitive in 46% (e.g. 32 strains). To the macrolides first generation representative – the stability erythromycin has been made up 43,6% (e.g. 28 strains), the sensitivity – 54,4% (e.g. 36 strains).

The ureaplasmas have already been appeared the highly sensitive ones to the lincosamides representative – the clindamycin: they are sensitive 71,9% (e.g. 46 strains), steady – 28,1% (e.g. 18 strains), and the aminoglycosides – to the gentamicin: they are sensitive 71,9% (e.g. 46 strains), steady – 28,1% (e.g. 18 strains). The simultaneous stability to these both preparations has been observed only in 9,4% (e.g. 6 strains).

The highly sensitivity has already been appeared to the doxycycline: they are sensitive 87,5% (e.g. 56 strains), steady – 12,5% (e.g. 8 strains). The sensitivity to the macropen has already been made up to the 90,6% (e.g. 58 strains). The simultaneous stability to them has been observed in 6,3%.

The Main Conclusions. The ureaplasmas singled out strains highest sensitivity have been shown to the doxycycline and to the macropen. So, the doxycycline and the macropen use is quite able to be recommended for the medical treatment scheme inclusion in the cases of the mixed – infections.

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#### THE INTESTINAL MICROCIRCULATION BED STRUCTURE

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The small intestine vascular bed has its multi-layer structure. The microcirculatory bed (MCB) linear interfascicular segments of the flat mesentery are being transformed into the entodermal canal circulatory segments: the subsero – muscular segment contours – the external (e.g. the mesenteric arcus and the vascular plexuses) and the internal ones (e.g. their submucosal plexus), and the last one – and this is the

mucosal plexus MCB external contour. The MCB mesenteries have the mainline network type, so the MCB muscular layer and the mucous membrane are being acquired the decuduocellular structure: in the habitat of the muscular layers, the simple micro – regions contour networks are being compressed in the arterioles and the venules basal plexuses, the modules are being forced out from their ansae (e.g. into the villi and the muscular layers), and they are being merged into the complex micro – regions – that is, the basal plexuses raisings. The intermuscular plexus is being formed by the small arteries branchings, as the straight (e.g. from the mesenteric arcus), well as the recurrent ones (e.g. from the submucosal plexus), having accompanied their small veins and the lymphatic capillaries by the inflows, the mucosal basal plexus – by the submucosal plexus branches and the inflows. The vessels and their plexuses are being complicated the MCB architectonics, by means of the thickening on the polymorphous basal plexuses and on the microvessels networks, especially in the submucosal basis and on the thin intestine mesenteric edge. The mucous membrane circular folds, the intestinal crypts, and the duodenal glands, the lymphoid nodes and the patches, the plexuses nervosus are also being deformed the MCB.

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#### **THE BEE'S COR AS THE LYMPHATIC VESSEL PROTOTYPE**

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The bee's cor – is the caudad closed polysegmental tube with the cross – striated muscles and with the compound axial valves. Their double valvae are being formed by the cor lateral finger – holes valves at the proximal convergence. The lateral valves couple distal valvae are being formed the caudal segment exit valve, and their proximal valvae – the cranial segment entrance valve. The double valvae intercuspidated canals of the bisegments border valve (e.g. the lateral finger – holes coupled valves) are being opened onto the proximal segment. The valves, having settled in such way, are being regulated the hemolymph axial current between the cor's segments and the interorgan liquid lateral inflow onto the cor from the body cavity with the coelomic epithelium lining retinens rostralis – of the strongly dilatated equicapillary bed: the venous bed reduction is being taken its place at the insects, in comparison with the annelids and the other arthropoda. The cor's valvate apparatus and the body cavity are being supplied it. So, the blood is being carried

only the nutritive and the biologically active matters, the trachea and also its branches themselves are being delivered the oxygen to the organs. Therefore, the insects' cor is quite able to be served the first evolutionary model of the active lymph drainage from the organs, which is much earlier and the nearer to the mammals' lymphatic vessels, than the amphibians' monosegmental lymphatic cor – their intervalvate segment prototype, that is the lymphangion, by L. Ranvier (1875).

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#### **THE ENERGY CONTENT AS THE HUMAN SOCIALLY SIGNIFICANT DISEASES**

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At present, the alcoholism, the drug addiction, the depression, that is the diseases and the illnesses, the aetiology of which is not quite and entirely understandable, are being related to the human socially significant diseases and the illnesses. And the human organism early ageing, which is often being defined not only by the age itself, but by the man's state and the way of his life, it is quite possible to be related to such diseases and the illnesses. We consider, that the man's bioenergetics state, which is being defined not only the oxygen consumption rate at the moment, is the basis of some human socially significant diseases and the illnesses.

So, it is quite well – known, that all these warm – blooded animals energetics is being defined by the metabolic processes intensity in the human organism, and it is quite possible to be calculated by the oxygen to be consumed amount. It is quite actually and the real one, the oxygen consumption intensity is constantly being increased, at the following load rise upon the human organism. However, the carried out numerous observations have been shown, that the different and the various people are being consumed the different and the diverse oxygen amount, at one and the same kind of the work fulfilment. So, the trained sportsmen and the athletes are running the short distance, quite almost not having changed their respiration intensity, though the respiration intensity is sharply being increased at the non – trained man. For all this, the both ones are making one and the same and also the equal kind of the work, having consumed the equal quantity of the energy. Consequently, the sportsman and the athlete much more actively is being included the additional source of his energy – «the energy content», which the man is being used at the rate of his loading. Thus, this content one is being formed also at the expense of the oxygen consumption, but it



is being formed much earlier, and, therefore, it is quite possible to be taken into account only at the energy supply balance calculation for the much prolonged period of time (e.g. during the 24 hours).

The energy content is usually being created in the animal's (e.g. man's) organism, mainly, during the state of his sleep, when the blood circulation just, as in the human brain, well as in the muscles is gradually being lowered. The human organism is being created the energy content, which is being consumed by the cells in the fission process, as the large physical, well as the mental loads during the 8 hours, at the expense of the energy supply decrease just into these human organs. The energy content quantity is being defined by the energy need, having consumed in the interval of the time between the prolonged rest periods (e.g. for the man organism – during the 24 hours). The children, the organism of which is being consumed the energy much more intensively, than at the adult people; they usually sleep much more frequently. Thus, the actively functioning animals' organism has the two sources of the energy. The first source of the energy – is the circulatory system, which is being supplied the nutrients and the oxygen, having entered into the human organism at the respiration, to the cells together with the flow of the blood. The second source of the energy – is the lymphatic system, by which the energy content, in the form of the lymphocytes, having contained the ATP (the adenosine triphosphate), is being supplied to the cells.

The scientists and the scholars have been supposing long ago, that, just in the human organism, the energy content is being existed in the form of the ATP molecules, which, in their turn, are being provided all the biochemical reactions in the human organism cells by the energy. But, the ATP molecules depot has not yet been found out in the human organism. Some of them have assumed, that the ATP molecules are being transmitted by the flow of the blood, but, at the same time, all these formations are being absent in the blood. However, the ATP molecules are quite able to be supplied to the cells, by means of the gap junction, which has been discovered by the American scientists and the scholars in the 1958 year. The carried out numerous observations have been shown, that the inorganic ions and the other molecules, which their mass is being achieved up to the 1,500 dalton, are quite able to be transited from one cell into the other cytoplasm, through the formed gap, having had about 3 mkm width. This transition is practically being carried out through the neighboring cells membranes nexuses, which are being formed the continuous water canal, having had the comparatively small diameter [1], at the interface junction. Through the gap junctions, the cells are quite able to be exchanged by the ATP molecules, which their mass is equal to about 500 dalton. Thus, cells, which are being needed badly in the energy, are quite able to be received the ATP molecules directly just from the other cells, which are quite able

to be carried out the energy carriers functions. So, the cells, having provided the energy transition, must be numerous ones, and to have the small diameter, and also to have the mitochondrial bioenergetics system, which is quite able to be synthesized the ATP ones. The small lymphocytes, which are quite able to be penetrated, practically, into the every points and the places of the multicellular human organism, are being suited the best of all for such kind of such mission carrying out. The lymphoid nodes are being appeared already at the fetation, and they are present just in all the human organism tissues. The overwhelming majority cells in the early embryos are being intercommunicated through the gap junctions [2]. The lymphoid formation laying in the bone marrow and in the human embryo thymus gland is being fallen on the embryogenesis fourth – fifth week, in the spleen and in the lymphoid nodes it is being fallen on the fifth – sixth week. So, the lymphoid nodes appearance, which are regarded as the reproduction centers, is usually observed just on the embryogenesis sixteenth – twentieth week. So, it is being accepted to be considered up to date, that the lymphocytes are being carried out only the immune function in the human organism. Then, it is not quite clearly, why the human immune system is being developed at the embryogenesis early stages, when the developing fetus is under the immune system protection of the maternal human organism. However, it is everything easily being explained, if to be accepted into the consideration, that the lymphocytes are quite able to be provided the developing human organism energy demands. In the human organism development early period, when the intensively dividing cells energy demands are quite able to be considerably passed ahead of the hematopoietic system formation intensity, the energy address transition is quite able to be rather efficient through the gap junctions.

The energy, which the human organism is being reserved during the state of its sleeping, is being constantly needed the further realization. Therefore, the awoken child is not able to be sat and to be played with himself quietly; he must certainly to be constantly moved around. The child, who is practically being deprived of his intensive movement possibility, he is growing up much worse, and he, moreover, is quite behind of his further development. So, the depressive reaction state is often being appeared at the children, whom the parents are constantly making to be learnt and to be limited their mobility. This depressive reaction state is being easily taken off, if the child is going in for sports, the outdoor games, and the interesting walking tours and the trips. The child's depressive reaction state is being easily taken off and also at the various and the different chemical preparations use: the alcohol, the drugs, and also the psychotropic substances. The cells are being begun their active work on the further destruction and also all these substances removal from the human organism, for what the considerable energy is being spent by them,

at the foreign substances (e.g. xenobiotics) entrance into the human organism. All this process is being resulted in the depressive reaction state to be easily taken it off. The alcohol, the drugs, and the psychotropic and also the psychoactive substances much easy accessibility is being developed the quick psychical and the mental dependence, and also the dependence – producing drugs at the children. And the children very often are being preferred the alcohol, the drugs, and the psychotropic and also the psychoactive substances, instead of the outdoor games and the sports and games. The children movable leisure and the spare time organization, which is being to be permitted to spend the energy content without the alcohol, the drugs, and the psychotropic and also the psychoactive substances is the children drug addiction prophylaxis and the necessary preventive measures.

If the depressive reaction state is quite character and the typical for the children just from the excess energy, then the adult people much frequently are suffering from the energy content insufficiency. The large energy content is being created in the young human organism, as the growing human organism must to be provided the dividing cells by the energy. Just after the 240 months or the 20 years passing, when the man's human organism has been stopped to be grown up, the demand in the energy is gradually being lowered, and step by step the human organism is being lowered the stored energy quantity. So, the prolonged sleeping necessity is gradually being lowered with the age at the man, and the insomnia is often being developed just in the old age. So, the sleeplessness is being resulted in the energy content further lowering, that it is being resulted in the cells' regenerative capability further lowering, and also, moreover, in the human organism ageing. Thus, the different and the various traumas are being cured much slower; the man's hu-

man organism and the animals' recovery process is usually being proceeded in much worse in the old ages. The stability to the different diseases and the various illnesses is constantly being lowered at the man. Thus, it is quite well – known to everybody, that the temperature is being increased, when the man is having caught the disease; the febrile states are usually being appeared at the man's disease and his illness. The temperature rise – is the human organism protective reaction from the infection. The temperature rise – is being brought to the infection death, and the human organism following recovery. The temperature rise – is being observed very seldom, at the elderly and the senior people's diseases and their illnesses, and the diseases and their illnesses are usually being proceeded in much longer. Thus, the old ageing prophylaxis and the preventive measures are the elderly and the senior man's human organism high level motor activity, which are quite necessary for the successful struggle against the insomnia and the sleeplessness, the large energy content accumulation, and the elderly and the senior man's human organism life security increase.

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Short Reports

**CHANGES OF CARBON STOCS IN CRYOARID SOILS OF TUVA UNDER THE GRAZING**

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Carbon Stocks and the storage of the soil organic matter have been determined by 3 principal factors: values of vegetable matter, entering to soil, the rate of the mineralization of the vegetable leavings and the mechanical structure of soil. The entrance of the Carbon have been conditioned by values the net primary production.

The paper has been considered the peculiarity of the accumulation phytomass and the entering to soil

the vegetable leavings on the different sites of the dry steppes.

Grazing on the steppes of Tuva by domestic animals has occurred since the first centuries A.D. and this has contributed to maintain the characteristic openness of the landscape.

In this study we were particularly interested in comparing Carbon Stocks of the dry steppes, at different intensities of human impact, with those of true steppe vegetation. True steppes are characterized by small brunch grasses. The main part of the green phytomass is made up of species which are resistant to trampling and able to regenerate rapidly after being grazed.

We established that the above-ground and below-ground plant material (the total biomass) in moderately grazed site (MG) are 30 t/he and in overgrazed site (OG) – 17 t/he (table 1).

**Table 1.** The storage of the soil organic matter and Carbon Stocks in Cryoarid soils of Tuva

Components	MG – 2008 y	OG – 2008 y
<b>Above-ground biomass, t/he</b>	250	180
<b>Below-ground biomass, g/m<sup>2</sup></b>	2800	1600
<b>Entering of the vegetable leavings, t/he</b>	11,5	4,3
Humus, % in the depth 0-10 cm	1,4	1,1
Carbon , t/he in the depth 0-50 cm	45	29

The table presents that the green biomass values of vascular plants were highest on the moderately grazed site and lowest on the overgrazed site. The amount of graminoid biomass decreased with increasing grazing intensity.

Differences of total green biomass values between the UG and OG sites were not statistically different but the value for the OG site was much lower. Below-ground plant material consists of stem-bases and tubers? As well as roots of different length.

Total below-ground increases considerably from the moderately grazed site to overgrazed site. The average from the season entering to soil of the vegetable leavings on the moderately grazed site - 11,5 t/he and on the overgrazed – 4,5 t/he.

The Cryoarid soils this sites differ by content humus. The humus horizon in the soil moderately grazed site contents 1,4% and 1,1%- in overgrazed site. Accordingly the storage of the carbon in this sites differ. In the moderately grazed site the storage of the Carbon in the depth 0-50 cm is 45 t/he. Therefore in this soil various intensity of the humus accumulation. It being known that the soils of the moderately grazed site approximate to the muchhumus types.

Thus, grazing has contributed to maintain the openness of the Ubsunur depression's landscape. Difference between moderately grazed and overgrazed sites may arise mainly from the different factors that

originate their xerophytic character: soil and climatic characteristics, respectively. Summers are very cool and the winters are hot and the soil with a low water storage capacity in the Central Asia.

Moderately grazing of Tuvinian dry steppes is resulted in higher biomass values for the above- and below-ground phytomass, entering of the vegetable leavings to the soil, the storage of the humus, Carbon.

**GRAZING PRESSURE INFLUENCE ON THE DRY STEPPES OF TUVA**

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**Introduction**

In this study we were particularly interested in comparing some phytomass properties of different intensities of grazing impact of Tuva dry steppe vegetation.

In Tuva winter pastures were supplied with pump-houses to provide a livestock with water. After collective farm disruption these pump-houses were demolished and pastures were left without water. Many winter pastures were abandoned and herdsman

have driven their flocks into river valleys. Many summer pastures transformed into full year ones with heavy grazing impact. Change of stocking rate leads to degradational or restrational succession which can be observed and investigated then and there.

The object of this paper is to describe a degradation and regeneration of grazed steppes as well as a balanced pasture with sustained use. The results obtained in Tuva steppes will allow to establish trends of change in major pools of plant material under different grazing impact. We will attempt also to provide some grounding for evaluation the resistance, i.e. a tendency of a system under impact to remain near to an equilibrium point and the resilience, i.e. the rate of an ecosystem return to the starting point after disturbance, in Central Asia steppe ecosystems (Begon et al., 1986).

#### Study areas and Methods

The study was carried out between 1996 and 2009 in geographical regions of Central Asia, in the Uvsu-nur depression of Tuva. This depression is located in the southern part of Tuva on the boundary with Mongolia. In Tuva were investigated dry steppes with different grazing impact.

Annual precipitation in Tuva steppes varies from 150 to 170 mm. The seasonal distribution of precipitation is rather constant: 70 – 80% of the annual total falls during the warm half of the year. The yearly mean temperature at Erzin is  $-4,5^{\circ}\text{C}$ . The coldest month is January with a mean temperature of  $-33^{\circ}\text{C}$ . July is the warmest month with  $22,0^{\circ}\text{C}$ . The growing season, i.e. the period over which the daily mean temperature remains above  $+10^{\circ}$ , lasts 130 – 140 days and the period with temperature above  $0^{\circ}\text{C}$  – 180 – 190 days (Experiment Uvsu-Nur, 1995). The steppes of Uvsu-nur depression belong to the ultracontinental grassland type.

Their species composition is dependent on relief, soil and grazing. One investigated steppe is located on the river terrace, three another ones represent submountain steppes. Erzin steppe is linked to alluvial chestnut soil, submountain steppes to loamy sand chestnut soils.

Erzin overgrazed steppe represents the full year pasture with heavy grazing at present. Moderately grazed Onchaalan steppe is winter pasture over long time Jamaalyg steppe was initially moderately grazed by sheep during winter. Now it is summer pasture with light grazing. Choogey steppe was in the past heavily grazed summer pasture. Since 1995 grazing decreased and now this ecosystem represents a stage of recovery succession.

#### Definitions and symbols

The following variables of the plant biomass structure are used (Van der Maarel & Titlyanova 1989). G = above-ground green biomass; D = standing dead plant biomass (attached dead); L = litter; R = living roots; Rh = living rhizomes; B = R+Rh living be-

low-ground organs; V = dead below-ground plant biomass; B + V = total below-ground plant biomass.

#### Field methods

At each site an area of 100 m x 50 m was marked, within which the species composition was recorded in July in each of ten 10 m x 10 m square. For other measurements a series of ten 50 cm x 50 cm square was located at random for each sampling occasion. The vegetation was clipped at the soil surface and the litter was collected. The above-ground plants biomass was sorted into green biomass per species and total standing dead biomass. Litter and lichens, if present, were washed on a sieve to remove soil particles.

Soil monoliths with a surface area of 100 cm<sup>2</sup> and a depth of 10 cm were collected in each square to a depth of 20 cm. The monoliths were washed and the plant material collected on a 0,25 mm sieve. All above-ground and below-ground plant biomass was dried for 24 h at 80 °C and weighed. Below-ground plant material was sieved to separate the fraction with the length > 2 cm. The samples were taken in may, July and September.

#### Results

Above-ground phytomass in dry steppe is dominated by a few species of perennial grasses and subshrubs. Both the dominants and co-dominants of dry steppes are spatially and temporally dynamic. The variation in dominance structure is most obvious in grassland ecosystem with different grazing pressure. The overgrazed steppe had only two dominants – *Artemisia frigida* and *Cleistogenes squarrosa* (Table 1). In the constantly moderately grazed steppe (Onchaalan) there were five dominants among which usual dominant of dry steppes - *Stipa krylovii* had the greatest contribution (% value). In steppe recovering after heavy grazing for one year four dominants were recorded. Abundance of *Cleistogenes squarrosa* which is typical for overgrazed steppe remained high. At the same time the contribution of *Agropyron cristatum* increased. This change in dominant structure is indicative of the recovery process. In steppe restoring for four years a dominant structure change is still in progress. The contribution of *Stipa krylovii* and *Agropyron cristatum* increased while % value of *Artemisia frigida* and *Cleistogenes squarrosa* decreased. The shift in dominance structure is regulated by the growth and death of plants which have a different resistance to grazing and trampling. Dominance structure is important indicator of pastoral succession.

#### Above- and below ground reserves of plant material

Dynamics of reserves of plant material different components was investigated in the moderately grazed winter pasture during three years and in overgrazed and in recovering pastures during one season in 1998 (Table 2).

**Table 1.** Total phytomass ( $\text{g/m}^2$ , mean+ SE) and phytomass share (%) of dominants ( $\geq 10\%$ ) in dry Tuva steppes under different grazing impacts. OG – overgrazed, MG – moderately grazed, LG-1 = lightly grazed during 1 year, LG – 5 = lightly grazed during 4 years

Parameters	OG	MG	LG-1	LG – 5
Total phytomass	65 ±	68 ±	58 ±	110 ±
<i>Artemisia frigida</i>	75	15	32	17
<i>Stipa krylovii</i>	-	35	20	36
<i>Potentilla acaulis</i>	6	12	6	4
<i>Cleistogenes squarrosa</i>	11	10	8	6
<i>Agropyron cristatum</i>	-	14	16	22
Total dominants	92	86	82	85

**Table 2.** Above and below ground standing crops in steppes. For G mean annual,  $\text{g/m}^2$  dw, 0 – 20 cm soil layer. OG – overgrazed, MG = moderately grazed, LG-1 = lightly grazed for 1 year, LG –4 = lightly grazed for 5 years

Components	OG	MG	LG-1	LG –5
Green phytomass, $G_{\max}$	65	68	58	110
Standing dead, D				
Litter, L				
D+L	95	268	237	230
Living below-ground organs, B	1635	795	1510	1135
Dead below-ground plant material, V	1066	837	1663	1376
Total plant material ( $G_{\max}+D+L+B+V$ )	2861	1968	3468	2851

There was no significant difference in the  $G_{\max}$  value among overgrazed, moderately grazed and lightly grazed for one year pastures but there was marked difference between these pastures and the pasture recovering for five years. In the latter the maximal green phytomass value was highest. The amount of graminoid biomass decreased with increasing grazing intensity but the opposite tendency is found for the herbs + semishrubs.

The values for above-ground dead biomass were similar for MG, LG-1 and LG – 5 and much lower for OG – pasture, both regarding standing dead and litter. Standing crop of above-ground phytomass ( $G_{\max} + D + L$ ) was roughly the same (295 – 340  $\text{g/m}^2$ ) in the recovering and moderately grazed pastures, despite the fact that quantitative species composition was different. In contrast, the overgrazed community had much less standing crop: 158  $\text{g/m}^2$  with 60% dead.

Below-ground standing crop of living organs was lowermost in the moderately grazed pasture and highest for overgrazed one. The high value of B in overgrazed community is due to the large contribution of heavy lignified roots of *Artemisia frigida*. In steppe recovering for one year the B value is also high. Apparently a root growth was stimulated by the remove of grazing pressure. Below-ground standing crop of dead mass was maximal in LG-1 and minimal in MG. So moderately grazed pasture differs by the lessened standing crop of below-ground living and dead mass.

The different value of standing crop of below-ground living and dead biomass may be connected with as different grazing impact as well as with seasonal and year –to – year dynamics of below-ground biomass. Below-ground dynamics is regulated by the growth and death of root and rhizomes of different species. The active growth of different organs of plants may occur at different time of the season and vary from year to year (Titlyanova et al., 1999).

The standing crop dynamics of living and dead below-ground organs were followed during three years in moderately grazed steppe. In 1996 the minimum of B differed from maximum by a factor 1.6, in 1997 – by a factor 3.1, in 1998 – 1.2. The mean annual value of B was 720  $\text{g/m}^2$ .

The regularity in dead mass dynamics was expressed not so clearly. The minimum of V differed from the maximum by a factor 1.3 – 2.2. The mean annual value of V was 1390  $\text{g/m}^2$ , i. e. twice as much as the B value.

Seasonal dynamics of below-ground biomass in steppes with different grazing regime in 1998 was pronounced. In overgrazed steppe B standing crop increased from May up to September while in steppe recovering for one year living biomass decreased during the whole season. The maximal standing crop in the pasture recovering for four years occurred in September after the minimal B- value reached in July. Hence the growth curves for B were different in steppes with different grazing regime. The same is true for V-standing crop dynamics.

So a difference in the standing crop of below-ground biomass associated with seasonal and year-to-year dynamics may be very large. A combination of changes in biomass caused by altered grazing regime as well as seasonal and year-to-year dynamics makes an analyze of a below-ground biomass response to a change in grazing impact difficult.

#### Conclusions

Changes in the biomass structure of grasslands under different grazing intensity can be expressed as ratios. With increasing grazing impact entering of the vegetable leavings to the soil and the storage of the humus, carbon decrease. Results for the moderately grazed site did not agree entirely with those obtained from dry steppes. The below-ground biomass values were highest at the moderately grazed site although differences with the overgrazed site were not significant.

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### ADHESIOGENESIS MODELLING IN A CASE OF SURGICAL CAUSED HORMONAL INSUFFICIENCY

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Last years, the quantity of surgically treated gynaecological diseases, used to be progressively increased. The most frequent surgical intervention is the total or subtotal hysterectomy with\ or without adnexa (in occasion of myoma and adenomyosis).

The percent of this operations is about 38% in Russia, 25% in Great Britain, 36% in USA, 35% in Sweden. The middle age of such a surgically treated women is about 40.5 years old. Its about 76.8% of hysterectomy with ovariectomy were realized to a women of 40-45 years old in Great Britain. In USA the quantity of hysterectomy is about 60000 per year,

in 60% of cases accompanied with bilateral ovariectomy.

In fact, the problem of adhesiogenesis is especially actual in operative gynaecology, because in the most cases, gynaecological surgery may attend a high risk of peritoneal adhesions forming, expanding beyond the bounds of pelvis. The rate of morphogenesis pelvic and peritoneal adhesions after obstetrical and gynaecological surgery is about 60-100%. For example, 92.6% - after supravaginal amputation of uterus, 95% - after uterine extirpation.

Postoperative adhesions has a great negative influence on a patients health condition, causes an intestinal obstruction, chronic pelvic pain syndrome, different surgical complications as an injuring of viscera and etc.

**Main aim:** An assessment of adhesiogenesis level under condition of hormonal insufficiency in the dynamics of a postoperative injury in the experiment.

#### Materials and Methods

The new experimental method of Adhesiogenesis modelling in a case of hormonal insufficiency was designed to determine the level of adhesive process. This model is reproducible on different kind of experimental animals. It were 30 nubulous female rats (Wistar Line) used in experiment. Their middle age was about 3 month, the weight was near 200 -350 grams. The method was realized by comparison of results of simultaneously provided experiments (a standard operational injury, uterine amputation without ovaries, uterine amputation with ovaries) were assessed under the experiment.

The level of adhesiogenesis in absolute numbers (TVA -total volume of adhesions) was assessed by us on the grounds of received macromorphometric data (length, diameter, thickness, area of adhesions) and devised formula. It is possible to determine and objectively compare the process of adhesiogenesis in different groups.

In accord of earliest classification, all adhesions that were founded were divided on chordal, filiform, arachnoidal, scarious or planar morphological types. Each adhesion was described with a special parameters: diameter and length of a chordal and filiform adhesions, thickness and the area of scarious and planar adhesions.

Taking into account of the chordal and filiform adhesions middle diameter is about 5 and 1.5mm and scarious adhesion thickness is near 1mm, it is enough to define its length (for chordal and filiform adhesions) or area (for scarious adhesions) to identify their volume.

The formula for calculating of the TVA (Total Volume of Adhesions) was:

$$V_{adh} = \sum l_{chord} \cdot \pi (d_{chord}/2)^2 + \sum l_{filif} \cdot \pi (d_{filif}/2)^2 + \sum l_{arachn} \cdot \pi (d_{arachn}/2)^2 + \sum S_{scar} \cdot h_{scar} + \sum S_{плочк} \cdot h_{планар},$$

V - volume, l – adhesive length, d – diameter of adhesive transversal section, S – area of adhesion, h – thickness of adhesion,  $\pi = 3,14$ .

**Results**

The data was processed by statistical calculation of arithmetical mean.

In the first group ( with a standard operational injury ) TVA was 0.45 cm<sup>3</sup>. In the second group (amputation of the uterus without ovaries) TVA was 0.73 cm<sup>3</sup>. In the third group (amputation of the uterus with ovaries ) TVA was 0,92 cm<sup>3</sup>.

**Resume**

TVA depends of the operational injury, so the widening of operational injury volume in a condition of attendant postoperational hormonal insufficiency activates the elevation the TVA.

The data was obtained by experiment allows to suppose the possible importance of such a clinical researches, including the reasonability of substitutive

hormonal treatment of the patients with surgical menopause.

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## EDUCATIONAL INTERACTIONS IN FORMING OF COGNITIVE ACTIVITY

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This article appeals to the modern educational situation dictated search and development of the new forms of educational interactions. Today there is a necessity for reorganization of traditional ways of training on the new forms, where the teacher and student are in the subject/subject position in the educative process.

Methods of interactive training promote the involvement of the students in active processing the reception and storage of knowledge. These forms allow everyone to join in discussion and solution of a problem, to listen to other points of view, to see multiregularity of a task etc.

These tasks of interactive training should be based on personal level of cognitive activity (personal position): non-active level, cognitive-emotional, cognitive-mobile, cognitive-creative level of educational interaction. Levels of cognitive activity provide a dynamic parameter to teaching. These methods create potentially higher opportunities of transporting of knowledge and learning experiences from an educational situation to the real.

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The interactions accompany man throughout life. It is known, the individual becomes a person only during interaction, i.e. mutual relationship with other people. In other words, the process of dialogue, interactions becomes the indicator of successful socialization of the person.

The man (especially it concerns the adult person) should learn how to structurally cooperate with other people, with the world around, with himself. The perfection of this process occurs during all life. But the stage of school training is especially important, where the child enters the special relations with adults and other children, which can be designated as area of pedagogical interactions.

In analyzing pedagogical interactions in an actual educational situation, it is necessary not only to characterize their structure and form, but also to reveal interactive methods and receptions, which promote development of cognitive activity of students.

Methods of development of cognitive activity promote the involving of the students in active processing the reception and storage of knowledge. It is necessary to relate to them group work, educational discussion, game modeling, educational dialogue, «a round table», «session of expert group», «debate», «judicial session», «about dialogues», «brain storm» etc. These forms of training are important for students, as they allow everyone to join in discussion and solution of a problem, to listen to other points of view, to

see multiregularity of a task etc. These tasks, as the psychologists note, allow students to solve difficult problems themselves, instead of simply being the observers. These methods create potentially higher opportunities of transporting of knowledge and learning experiences from an educational situation to the real. They also allow «to compress» the time and are psychologically attractive to the students.

Despite of variety of the forms of interactive methods realization, there are certain rules, which observe involve reflective thinking and provide children with interactive skills of behavior. These rules include:

- there are no «actors» and «spectators», all are participants;
- each participant deserves to be listened to, not interrupted;
- if the given information is not quite clear, the questions «about understanding» are asked and only after that are the conclusions made;
- the ideas may be criticized but not the person;
- the purpose of discussion is not in proving the «rightness» of an opinion, but in an opportunity to find the best decision, having learned the different points of view on a problem.

In preparation for conducting these activities, the teacher should:

- set questions with an «open end» (i.e. such, which are focused not on one cor-



rect answer, but on the statement of the various points of view on a problem);

- realize his position not as guiding in interaction, but as a neutral facilitator, that enables the students to state various points of view in the class without fear to be interrupted or stopped etc.;

- analyze the lesson for situations, where the interaction with the pupils fell apart, why that happened, how to avoid it in future etc.;

- make notes on the success of the lesson, its culmination, productivity etc.

The serious job of adapting and following these recommendations to use in a school is necessary. In this connection, working out proper program is the main component in the process of reorganization of Russian school. Development of this program assumes:

- technique of «implementing» interactive methods of studying;

- improvement of educating techniques in small cooperative groups;

- development of methodology of solving problems (situational analysis, game, imitation of situations);

- research of diverse perspectives (critical statement of questions, disputes, brain storms);

- realization of methods of management of group process (how to implement interactive, teaching to cope with noise and other techniques of class management).

Rather than an abrupt switch from one system of education to another, it is necessary to have a transition period, in which students are prepared for another role – mobile role in an academy situation. Therefore it is necessary to take into account both a student, who is ready for this form of studying and the one who occupies a passive position in educational interaction and should master the skills of group interaction, which promotes the development of cognitive activity.

**I. Expressed objective position:** the student is passive, poorly reacts to the requests of the teacher, and does not show interest neither in joint, nor in individual work,

joins in the activity only as a result of pressure of the teacher. These students do not have developed emotional, intellectual and behavioral skills for training in interaction. *Non-active level of educational interaction.*

**II. Mainly objective position:** the active involvement of this student is shown only in the certain situations (interesting contents of a lesson, unusual ways of teaching etc.). The readiness for interaction is shown at an emotional level but is not supported by known skills of productive cooperation. From time to time, this student shows good results in group work, however success is not constant. *Cognitive-emotional level of educational interaction.*

**III. Mainly subjective position:** the student has acquired successful of educational cooperation, easily joins in and accepts group work, has knowledge capable to accelerate search of the common decision. Their previous success provides emotional readiness for joint activity. Thus the student recognizes the teacher as a facilitating person in educational interaction. *Cognitive-mobile level of educational interaction.*

**IV. Expressed subjective position:** the student in educational interaction asserts mainly his own position, assumes (as justified or unjustified) the role of the leader, often resists the opinion of group, or the opinion of the teacher. This type of student is the most difficult for the teacher in encouraging of educational interaction because success is dependent not only on the ability of the student to cooperate, but also from readiness of the teacher to accept questions and decisions offered the student. *Cognitive-creative level of educational interaction.*

These levels of cognitive activity provide a dynamic parameter to teaching. Teacher, tutor and pedagogue can help the student proceed from an non-active level on cognitive-emotional, from latter - on cognitive-mobile etc.

We will try to analyze psychopedagogical features of cognitive activity of every type, and to determine tactics and

strategy of organization of educational interactions with each group.

A teacher's tactics of working with students in the first non-active level are based on creation of an atmosphere in class, which would let the student get rid of fear and awkwardness. S.L. Rubinstein emphasized, that «it is easier to do your work in friendly, than in spiteful environment... Malevolence holds down, paralyses, especially sensitive and unstable people. If they feel a benevolent atmosphere, they find themselves at once, regain their composure and show themselves from the most positive side». And the feeling of inside freedom is one of the main factors promotes the state of readiness for stirring up of efforts, attract attention and activity.

It is important for the teacher to establish the kind, friendly contact with the students of this level. The basic technique assisting to achieve this is an «emotional stroke»:

- to call students only by their names;
- to not avoid a praise and approval;
- to keep an even voice tone, with stimulating intonation while conducting classes;
- to touch the child, calming or encouraging, if necessary;
- positive construction of phrases: avoid saying: «If you will not carry out my requirements, I...», without orders: « Stop talking!» and so on.

This transition is possible due to the special atmosphere of lessons focused on psychological emancipation and emotional inclusion of the students in general educational activity. The path is: a state of comfort, openness → removal of fear before joint educational work → readiness to join in cooperation with the teacher or classmates → expectation and emotional readiness for the new forms of educational interactions. Thus, the teacher prepares a student for gradual transition from non-active to cognitive-emotional level of educational interactions.

The educational activity of students of the second level depends on emotional attractiveness of educational interactions (novelty

of studies, certain ease in achievement of result etc.). If it is interesting, they join in educational job with pleasure. In contrast during the traditional lesson the desire to cooperate, which is not supported by intellectual efforts and appropriate achievement, is noticeably reduced. Because these students have no specific knowledge and educational skills about, such inclusions occur infrequently.

Tactics of educational interaction with the students of this level of activity involves in an emotional reinforcement of their subjective (mobile) condition in educational activity and in formation of the basic initial skills of joint activity. The pedagogical strategy consists of a focus on the basic skills of successful joint activity. Readiness and skills to facilitate the certain educational purpose, including emotional, intellectual and behavioral features, are characteristic of the student with a cognitive-mobile level of educational interaction in education.

The students of this level accept with readiness those forms of work, which are offered them by the teacher, react adequately to an educational task, frequently offer original ways of making decisions and can work both independently and in groups. But these students begin to get bored during a lesson, if the learning material is simple enough, or if the teacher is engaged with weaker classmates. Gradually they get used to having limits of an educational task and do not want or desire to search for the non-standard more creative decisions. They prefer to work independently, avoiding joining in educational interactions with their classmates. Thus, there is a danger of regression of pedagogical interactions from a mobile-conducted level to cognitive-emotional position. That is why pedagogical work with the industrious students is just as important, as for the students of the first and second levels of cognitive activity.

In discussing the basic techniques for joining in students at the cognitive-mobile level of cognitive activity, it is possible to name all problem, partial - search and heuristic situations, which are created at

lessons. It is possible to offer students the special role situations: one can work at a lesson as an «expert», another as an «observer», estimates the course and rate of the lesson; third in a role of «wise man» sums up etc.

Hence, tactics of educational interaction for the teacher to use with the students of this level consists of support of the cognitive-active position of the student. The pedagogical strategy of the teacher in working with the given students consists in motivating them to see themselves not only as «conducted», but also as «conducting».

Interaction with the students of fourth, cognitive-creative level, are developed mainly between the student and teacher. During group work these students aspire to ratify themselves in a role of a leader. Sometimes such situation results that the leaders «discourage» activity and initiative of other students.

On the one hand, it is necessary to offer students such forms of educational interactions, which successful performance depends in the greater measure on joint efforts of the whole group, instead of on one student. On the other hand, the teacher also should create conditions for realization of student's leadership; otherwise educational interaction becomes a situation of antagonism. Therefore the students of cognitive-mobile level can be offered more difficult tasks, rather than other classmates. The successful performance of such task will increase the leader position of the student, and in case of failure the teacher can ask the

group «for help», showing the positive aspect of cooperation.

Thus, tactics of pedagogical interactions in the work with students of a cognitive-mobile level in educational interaction consists in creating conditions, where the leader position of the student is realized without affecting other classmates. The pedagogical strategy is focused on formation of consciousness and behavior of students with skills of joint work with other students.

Summing up consideration of forming cognitive activity in educational activity, we are going to stop with the organization and realization of lessons. The structure of similar lessons provides not less than four basic models. The educational interactions can be realized linearly: consecutive work of the teacher with every group of the students. The lesson can be based on «mosaic» interaction supposing inclusion in educational activity of appropriate groups depending on an educational task. The lesson can be active: when the conducting role in educational interaction is given to the students with a high level of activity for training others. And at last, the interactions at a lesson can be complex, if there is combination of all offered variants. The main criterion of a lesson should become the inclusion of the various forms of educational interactions for all the students without exceptions, at a level of their real and potential opportunities.

Thus, forming of cognitive activity of students deviates only from pedagogical problems, but should be the subject of research of psycho-social sciences.

*Materials of Conferences***ABOUT INDIVIDUALIZATION IN CONTEMPORARY EDUCATION**

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There's an intensive search of a new model of educational system that could meet aims of the 21<sup>st</sup> century or maybe even the whole third millennium at present time. Orientation for the future can be carried out by, for example, metaeducation [1]. The concept of metaeducation aims to bring processes of globalization in society under regulation and remove their elemental negative consequences. It is not a secret, that scientific worldview taught at school and university is often separated from the contemporary worldview. Knowledge separated from life is not functional.

Metaeducation (from Greek meta – between, after, in) - is a transit from social knowledge to social self-consciousness as pre-behavioral structure, from generalized worldview perception – to a worldview, human's understanding of his place and his real role in Society and Nature. The strategy of metaeducation comes from "the ideal of learning people", formulated by V.I. Vernadsky, and reflects such characteristics of Russian civilization as "big space" and "big time" (according to M.M. Bakhtin).

It is exceptionally important for metaeducation as constant educational process to differentiate reflection of individual self-conscience from metareflection of social self-conscience. Metaeducation gives necessary stability to all information culture, including video sequence and information infrastructure, provides continuity, creates premises of civilizational and personal identity, warns from moral mistakes and substitutes of morality, and confirms verity as basis of normal social conscience [2].

It's known that in cognition methods that allow arresting subjective feelings and create objective worldview are being worked out. Occurring function totalitarianism allows viewing individual singularity and deviation from standard as pathology or right violation. We can't, certainly, say that this program was general and had 100 per cent success, but it formed people and deformed them. A right for individuality had few and it should have been enough reasonable (extraordinary brilliance or special economical position).

It is not mere chance that theory of individuality has not been worked out for a long time. Seemingly, natural man's aiming to be noticed and to take the highest position get devastating. His conscience loses the feeling of big time and far consequences of his deeds and replaced by short-timed situations appeared because of needs.

The meaning of concept subjectiveness is changed in a new paradigm. It has been thoroughly arrested from all forms of conscience as a source objec-

tive view deformation. Research methods that reduce the effect of deformation brought by a human were and are still being worked out. And beyond scientific research subjectiveness was considered a reason of false conclusions.

In the sphere of social activity professionalism, specialization, role adequacy was defined by features, equally obligatory for everyone. This function totalitarianism demanded from everyone dispensation from subjective peculiarities as from hindrances lowering the final results.

Even in the sphere of communication general rules were worked out; they should save a man from conflicts, caused by people's differences and their subjective preferences [3].

Contemporary situation supposes reconsideration of human's subjectiveness meaning. In the sphere of perception we discover a number of appearances that come to a man only through personal experience. The same corresponds to the field of specialized knowledge, but the greatest part of life situations may be cognizes by subjective experience. M. Mamardashvili wrote about it "...There are such events that should be overlived and over again adjusted, born in a bed of endless potencies" [4].

He named this form of cognition individuation and insisted on its importance in a man's life: "...who and what will I be depends on the world individuation, a lot in me and my fortune depend on that unique form in which I, for instance, fell in love or made my first experience of live, as on any other essential human feature or condition" [4].

In the sphere of different forms of activity human psychosomatic polymorphism and subjective peculiarity of human experience can be considered as not yet used potential of the humanity. Of course, that supposes profound research of things connected with the subjectiveness of peculiarities, and should be included in the development program as an important branch. Moreover, analyzing human subjectiveness we may point out one more peculiarity. Preferences, predilection, subjective selectiveness means for a man an opportunity to act without any coercion, to do well without discipline regulations, to keep an appearance in voluntary not-falling attention. And it is not a private case, but common position, happening with everyone.

Subjectiveness is closely connected with the understanding of human reality. An old belief that we all live in a common world, equal to everyone, needs to be rethought. Objective world, suggesting only one verity, to which a man is close while bridling his subjectiveness- is a model does only for scientific research and pragmatic conscience manipulation and even then to a narrow limit.

V.I. Vernadsky called science and philosophy fields of personality, and in virtue of his untraditional

view upon these appearances it becomes clear that scientific research is overlaid by human subjectiveness and come into zone of causality, coming from the man itself. People are as if settled in these spheres of activity, with all their aims, hopes and preferences. It is impossible to sterilize the participants of these and other forms of activity from their subjective-life orientations. That's why it is more important to learn principles of their existence and take them into consideration in all programs of education and communication. That allows to fall outside the limits of objective world as enough in our aim to understand a man.

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#### THE PERSONALITY AS THE EDUCATIONAL PROCESS OBJECT AND SUBJECT

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The growing up man's education, as the multiple personality formation is being made up one from the contemporary society central tasks. The formation in the historical society development process is not being happened automatically. So, it is constantly needed the definite efforts from the people's side, and all these efforts are being directed at the means and the objective social conditions making, as well as at the new possibilities realization for the man's moral and spiritual improvement and his further perfection, having opened at the every historic stage. The man's development real possibility, as the personality is usually being provided with all the society's material and the spiritual resources aggregate in this process [2, 3].

The objective social conditions presence, of its own accord, is still not be solved the multiple personality formation challenge. For this purpose, it is necessary the process personality systematic development organization, having based on the knowledge and the objective regularities record keeping, the upbringing,

the education and the training, which is being served this development necessary and the universal and the general form. The educational process goal set is being consisted in order, that the every growing up man should be made the humaneness and the humanity fighter, that is constantly being needed not only the children mental and the intellectual development, not only the skills to think independently, to refresh, to renovate and to widen their knowledge, but and the way of the thinking and the mentality development, the relations, the views, the senses development and the further maturing, the participation readiness in the social, the cultural, and the political life, the social – personality formations, the abilities and the mentality development, the nurture of the mind, and the self – realization, the central place in which is being occupied the capability to be the social and the public relations subject, the capability and the participation readiness in the socially necessary activity [1, 3].

So, the child is constantly being included in these or other social practice forms; and if its special organization is quite absolutely absent, then the traditionally formed its forms are being had the educational influence upon the child, the effect result of which is quite possible to be appeared in the contradiction with the upbringing, the education and the training goals [2].

The historically formed education system is practically being provided the taking possession of the capabilities, the moral standards and the spiritual orientations, which are being corresponded with the specific society's demands by the interested group children, but, over some time, the organization means and methods are being become the quite unproductive ones [4].

If the contemporary society is being needed the new group capabilities and the needs formation at the children, then, for this purpose, it is needed the upbringing, the education, and the training system transformation, which is quite capable to be organized the labor and the work activity new forms efficient functioning. For all this, the developing upbringing, the education, and the training system role is being come out into the open, having made the analysis object and also the purposeful organization [4].

The man's formation, as the personality, is being needed from the society the constant and consciously organized public and the social upbringing, the education, and the training system improvement and the further perfection, and also the traditional and the spontaneously emerged forms overcoming.

Such transformation practice of the emerged upbringing, the education, and the training forms is quite impossible without any basis on the theoretical – scientifically psychological knowledge of the child further development regularities in the ontogenesis process, as there is the distortion danger of his genuine human nature without any basis on such kind of the knowledge [3].



The humanistic relationship essence towards the child upbringing, the education, and the training has been come out just in the personality activity, as the competent subject, having enjoyed full his rights, but not the upbringing, the education, and the training process object. So, the proper child activity is being the educational process necessary condition, but, at the same time, this activity itself will have to be formed on the basis of the historically emerged standards creative use [2].

Therefore, it is much significant how to be built the pedagogical and the educational process, in order the teacher would direct the whole child activity, having organized all his active self – bringing, the self – education, and the self – training by means of the independent and the responsible actions by the improvement and the further perfection [4].

The educator – teacher, as is quite able and is being obliged to help to the growing man to be passed over this – the always unique and the independent – the moral – ethical and the social development way. So, further development is being happened, in the result of the socially selected forms and the activity methods taking possession – the children orientation formation on the defined and the specified values, the complete independence in the complex moral challenges solution. Thus, the independent choice or the content and the activity goals awareness by the children is being come out by the educational process central condition [1, 2].

So, the upbringing, the education, and the training is usually presented by itself not the children, the teenagers and the juveniles, the young people adaptation to the social being forms, and also to the defined and to the specified standard. The educational process is usually being presented by itself the growing up man's purposeful development, as this man the unique and the unprecedented human individuality, the moral and the creative forces improvement and the further perfection through the social and the public activity building [2].

Thus, «to be brought up – this is meant to direct the man's subject world development», on the one hand, having acted, in accordance with that moral standard, and also with the ideal, which is being personified the society demands just to the growing up man, but, on the other hand, having had for the object of the each child individual peculiarities and the special features maximum development [4].

The man's personality – this is the different and the various factors effect result and also their interaction. Some of them are being acted, more or less, independently from the people's will and their consciousness. The man's biological nature, the social and also the public relations, the social and also the community psychology phenomena, the way of the life, the geographical environment, and the micro environment conditions are being related to them. The other ones, in the more or less degree, are being de-

pendent from the people's will and their consciousness. This is – the ideology, the state's activity, and also the social Institutions, the public and the community offices, and the public establishments. The factors' third group is being assumed the further organized development. Practically, all these factors, as the whole, are being provided the personality formation [1].

Consequently, the man's personality formation – this is its formation process under the numerous and the various natural and the social and the public factors, the external and the internal ones, having acted spontaneously and in accordance with the definite and the specified rules and the guidance, with the definite and the specified means and the methods use [4].

Such kind of the approach to the upbringing, the education, and the training process building – as the active purposeful personality formation – is being coordinated with our methodological guideline for the society role estimation and also the growing up man just in his personality formation. So, the up to – date and the contemporary science achievements, including the domestic philosophers, the psychologists, the teachers and the pedagogues labors, and so on, are being testified on the fact, that only in the social environment and the public environment the man's social behavior programs making out is being happened in the purposeful upbringing, the education, and the training process, the man, as the personality is constantly being formed. For all this, the personality development social conditionality is being borne the historical – specifically character. But the personality historical – socially formation itself is not being presented by itself the social and the public relations passive reflection. Thus, having come out, as the object, well as the social and the public relations result, the personality is being formed through its active the social and the public actions, consciously having transformed, as the ambient environment, well as the personality itself in the purposeful activity process. The most significant and the important in the man, having defined him, as the demand and the need the developed personality in the other's well – fare and the well – being just exactly in the purposefully organized activity process [2, 4].

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### THE INNOVATIONS IN THE HIGHER SCHOOL: THE CURRENT STATE AND THE DEVELOPMENT TENDENCIES

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During the 20<sup>th</sup> century, the experiments are intensively being carried in the search of the school and the Institute of the higher education development new ways in the world – wide practice. Consequently, the enormous variety of the schools types is being taken its place [4, 5].

The world – wide education spatial structure is being embodied and realized the territorial and the statistical proportions in the national system development of the every country, the separate regions and the continents, the global interaction between the educational systems of the separately taken countries and the regions [1].

Such properties and the features, like the dynamism, the internationality, and also the various connections density between the constituent parts and the educational systems concentration are quite character and typical, especially for the world – wide educational space [7].

Thus, the separate regions types have already been formed and developed, in the result of the world – wide integration processes towards the end of the 20<sup>th</sup> century. The last ones have already been organized by the international cooperation indication in the field of the education and the influence degree upon the other countries and the regions educational growth and the further development. So, the Western Europe, the USA and Canada, the Latin America, Africa (besides the South African Republic – SAR), the Asian and the Pacific regions, and also the former USSR (e.g. CIS) and the Eastern Europe regions are being related to them [2].

The UNESCO is carrying out the normative legal support function of the world educational space development process.

At the present time, the following educational models have already been made up in the world [7, 10].

The American Model: the junior high school – the high school – the senior high school – the two – years college – the four – years college in the University structure, and then the MA course and the postgraduate (PG) course.

The French Model: the united college – the technological, the occupational and the general ly-

ceum — the University, the MA course and the postgraduate (PG) course.

The German Model: the general school – the non – classic secondary school, the gymnasium and the middle school – the Institute, the University, and the postgraduate (PG) course.

The English Model: the consolidated school – the Grammatical and the secondary modern school – the college — the University, the MA course and the postgraduate (PG) course.

The Russian Model: the comprehensive secondary school – the senior secondary school, the gymnasium, and the college – lyceum – the Institute, the University, and the Academy – the postgraduate (PG) course – the Institution of the doctoral candidacy.

The education new models search is being on, and this process is the continuous one. The practice is being confirmed the education new models efficiency.

So, the multileveled system is being made up in the higher education system, in which the Institutions of higher education of the secondary occupational, the higher occupational and the postgraduate (PG) education are being included [8, 10].

The educational system is continuously being developed in the contemporary Russia, and the constant renovation and the self – development is character and typical for it. Especially, the powerful innovative process has been spread the Russian educational system in 1980 – 90 – es years. The gymnasiums, the lyceums, the colleges, the schools of the different profiles and the various directions, such as: the merchant, the Cossack, the farm, the marine schools, the cadet corps, the adaptive educational Institutions, the laboratories – schools, the original educational complexes, and also the national schools (e.g. the Jewish, the Kalmyk, the Nenets, and the Finnish ones) have been appeared, instead of the former united and the uniform school. So, the international schools and the Universities, the private schools and the Institutes of the higher education, the colleges and the Universities have also been appeared in the united educational space [6].

The elementary school, the secondary school, and the higher school development history not only is being continued the specific country traditions, but it is also being entered into the world – wide experience. Therefore, they say, as on the school and the Institution of the higher education general tendencies, well as on the defined and the specified country's national educational system [3].

In the history process, the specific types and the special models of the educational systems have already been made up, and they have been formed in the different and the various countries. But, the University has already been accepted, as the higher education universal type and the kind throughout the whole world [9].

They usually judge on the school or the Institute of the higher education, the college or the University efficiency by the generally accepted criteria, and

the indications, and the indices in the world – wide practice.

Thus, the University education, the science and the culture correlation is usually being considered in the different and the various aspects [9]:

- in the historical context, having included in itself the specific and the social Institutions, as the development spheres and the human education and the human training;
- in the framework of the higher education culturological paradigm;
- under the cultural and the historical University type conditions, as the educational system;
- as the world – wide and the national University education model;
- through the academic curriculums, the catalogues, the programmes, the academic disciplines, the educational programmes in the Universities system;
- the qualified experts and the specialists preparation and the training;
- the University senior image description and the prediction, as the cultural and the well – educated person of the specific historical epoch;
- through the University medium specific character and the feature opening;
- the generalizations, the preservations and the cultural and the educational traditions revival in the University;
- through the innovative processes in the higher education system.

The two groups of the indications are being related to the Institute of the higher education, the college, and the University work efficiency assessment criteria: one – for the Institute of the higher education, the college, and the University assessment in the framework, as of the country, well as of the higher education whole system, the other one – for the Institute of the higher education, the college, and the University peculiarities and the specific features assessment and the Institute of the higher education, the college, and the University development dynamics [8].

Today, the whole world is being united by the concern on the citizen's upbringing, education and the training of the whole planet. Therefore, the world – wide Community is being tended effectively to the human formation and the foundation global strategy creation, irrespectively from his residence place and also his educational level [4].

At this time of the days, the world – wide educational space development tendencies are being predicted, and the regions types by the educational systems interaction indication are being singled out, and also their responses upon the integration processes. All the countries are being united by the comprehension, that the up – to – date education will have to be the international one. That is, the University education is being acquired the poly – cultural education features and the characters. In other words, it is being developed the possibility to assess the phenomena from

the other person's position, the other cultures, and also the other social and economic formation. Thus, the poly – cultural medium is being created, having assumed the cultural self – determination freedom of the future expert and the specialist and also his personal-ity enrichment [5].

In the world, the tendency is being revealed to the different and the various types of the Institutes of higher education, the colleges, and the Universities integration (under the aegis of the classical University) into the educational scientifically megapolises of the continental, the inter – regional and the state significance. Now, the Universities consolidation with the industrial complexes is being observed in the different and the various countries. Thus, the basis and the necessary foundation are being formed for the scientific inquiries and the further investigations, and also the unique experts' preparation and the specialists' training for the contemporary firms, the present companies and the enterprises [4, 5].

The higher education system reformation in Russia is being characterized by the optimal correspondence searching between the established usages and the traditional evidences in the domestic higher school and the new trends and the ideas, having connected with the entry into the world – wide educational space [10, 11].

The modern innovation main trends and the tendencies in the University education system are the following [9, 10]:

- The higher education organization multileveled system is being provided the wider mobility in the learning rates, in the future occupation and the specialty choice, and the seniors' capability to master the new specialties on the basis of the already received University education.
- The powerful Institutes of the higher educations, the colleges, and the Universities enrichment by the modern informational technologies, the wide powering on the "Internet" system, and also the students teaching distance forms intensive development.
- The all Institutes of the higher educations, the colleges, and the Universities integration with the leading Universities, as in the country, well as throughout the world, that it is being resulted in the University complexes' advent.
- The Russian higher school transformation to the self – financing.
- The Russian Institutes of the higher education, the colleges, and the Universities inclusion into the higher occupational education renovation, with due regard for the world – wide standards requirements.

Therefore, the Russian Institute of the higher education, the college, and the University transformation is being observed into the research – test work regime on the new academic curriculums, the educational standards, the new educational technologies,

and the management structures approbation and their further approval.

The Institutes of the higher education, the colleges, and the Universities, having changed in the innovative searching process, are being related to the self – developing educational systems category.

The schools and the Institutes of the higher education, the colleges, and the Universities, as the world – wide instructional – educationally systems have already been passing many centuries – old way of its historical development. On the one hand, they have exerted the considerable influence upon the accumulation, the preservation and the culture and the society progress, as a whole, and, on the other hand, they have felt on themselves the cardinal changes variety, having passed in the society, the science, and the culture of all the countries and the nations [6, 7].

So, the University is raising much high up to the mankind achievement tops the whole mastering and the human creation of the cultural values process. It is being conditioned and the fact, that the University educational content is continuously being enriched from the cultural heritage of all the countries and the nations, from different and the various fields of science, the human life and his practice. Therefore, the higher education is being became the necessary and the significant development factor, as of the separate spheres (e.g. the economy, the policy, the culture, and the science), well as of the whole society [9].

Thus, the pedagogical Universities are quite able to give the help in the new knowledge receiving on the educational practice challenges in the world, to render the necessary assistance and the help in the number of the actual challenges of all the education levels and the types, as the educational, the cultural, and the research and scientifically centers. So, the Universities potential and their autonomy are quite able to be used for the large ethical and the scientific and the pedagogical, and the social challenges solving, with which the mankind and the society will be dealt with in the near future, and also to be served the integrating element of the general education system modernization, having kept and preserved the best traditions of the domestic education [9].

None development is not quite able to be without the higher education: exactly the higher school is fully responsible for the teachers' preparation and the further training, for the programs development, and for the investigations carrying out in the education field. So, the Universities will have to be the active participants of the actual and the burning issues and the urgent challenges solution of the present: the misery, the intolerance, the cruelty, the illiteracy, the hunger liquidation, the environment protection preservation. Thus, the school education radical reforms comprehension is being gone on in the framework of the pedagogical University in the end of the 20 – th century, and the management new philosophy formation by the education and by the educational policy [9, 10].

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## THE EDUCATION AS THE PERSONLITY DEVELOPMENT BASE COMPONENT

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The education is being included in itself, however, the two aspects: on the one hand – this is the social experience transfer process to the rising and coming generations by the society, that is the teaching process, on the other hand – this is the social experience mastering level by the man, which in the given case, it is being included in itself the accumulated and the stored knowledge on the nature, the society, and the man transfer process, these knowledge use methods in the practical activity, the new knowledge getting methods, and the relations nature towards the reality orientation and the awareness on the basis of the accumulated

and the stored knowledge and also the know – how. So, they are being formed and their own and the proper relation towards the reality orientation and the awareness in the experience transfer process to the rising and coming generations by the society [2, 7].

The education, as the system is being presented itself the establishments and the institutions developing network of the quite different type and their level. So, the education basic elements, as the macrosystem, having had the state status, – these are the preschool, the school, the secondary special, the higher, and the post graduation additional education [9].

The education content is being defined in the Russian Federation (RF) Law, as the one «from the economic and the social society progress factors, and it should be oriented: upon the personality self – determination provision, the conditions creation for the self – realization; upon the civil society development; upon the legal state strengthening and the further improvement and the perfection» [6].

So, it should be noted, that the education content – this is also and the didactical implementation and the knowledge realization on the world, and the man's activity methods in this world, his creative activity implementation and his further realization experience, the relations standards to the world, to the people and to themselves. The education content – this is, however, the education basic types elements defined and the specified correlation [3].

And the «education system» notion and the conception is the not less considerable one. It is being considered, as the educational programs aggregate, the educational establishments and the institutions network and the management corresponding bodies by them in the Law. So, the educational system is quite able to be considered, as the education significant types defined and the specified aggregate, in the scheme [8].

At the different and the various society evolution stages, and the corresponding education types have been appeared, the correlation and the aggregate of which have been defining the content and the education system at the public development each stage. So, the education process has generally been borne, however, the imitative activity character, at the very first stages of the human society formation. The experience has been perceived by the rising and coming generations in the direct practical activity process, where, first of all, the practical abilities, the skills, and the experience for the different and the various activity types carrying out, which are the significant ones, for the defined and the specified society development level at them: the food getting, the fire strike, the human body protection from the temperature fluctuation and its variation, the simplest means of the labor and the work use and so on. The knowledge on the ambient nature by the mankind during the prolonged period of time has been accumulating rather slowly. The people have been observing the defined and the specified, and the repetitive phe-

nomena, having taken their place in the reality orientation and the awareness, they have been noticing their regularities, but not always they were able to be comprehended all these phenomena causes and the reasons. At the very first stages, the education process society formation has been borne, however, the rising and coming generations' pre – occupational training and the preparation elementary prototype on the most significant practical abilities, the skills, and the experience working out, having provided the man's vital functions and his vital activity [9].

And, it is no mere chance, the education present – day process, as such, is being begun not so much from the knowledge formation, as, first of all, from the man's labor and the work activity natural organs development (e.g. the child's brain, the hands, and the feet) and also from the treatment practical abilities, the skills, and the experience formation with the simplest means of the labor and the work (e.g. the skills to use a pencil, a pen, a knife, a needle, an awl, scissors and so on and so forth), and also from the reading, the counting, the writing abilities and the skills and the experience. The other abilities and the skills and the experience are being formed at the children already at the preschool age, they are familiarizing themselves with the man's practical activity significant and the important types: they are playing in the hospital, in the store, in the school and so on. Such education character is quite able to be considered, as the elementary pre – occupational education first stage.

This is the education original and the peculiar type, and it is quite impossible to be brought it only to the technological training, the peculiarity and the special feature of which is being consisted in the fact that it is being realized at the school just in its pre – occupational (e.g. general labor) part, as it has been noted in the basic scheme [1, 4, 5].

It is quite possible the educational process development, as through the contradictions settlement, well as by the evolutionary way through the well – established educational system further improvement. The contradiction between the social demand to the man's scholarship and the academic literacy and his educational level, the education quality and the type is being come out, as the main educational process contradiction [7, 8].

The educational systems, as well as the every systems, in general, having had their structure, are being consisted in the defined and the specified elements, which are being interconnected between each other. The personality teaching, the upbringing, the education, the training, and the development is the every educational system aim. Thus, the educational system all the elements have been included not so simply into the interaction process, but the main peculiarity and the specific feature of their connection is the mutual assistance, having directed upon the per-



sonality teaching, the upbringing, the education, the training, and the development aims achievement.

The man's development just in the educational system, as the personality, well as the activity subject – this is the obligatory thing: 1) the intellect development, 2) the emotional sphere development, 3) the stability to the stressors development, 4) the self – confidence, and the self – reliance, and the self – acceptance development, 5) the positive relation to the world development and the others reception, 6) the independence, and the autonomy development, 7) the self – actualization and the self – perfection motivation development [7, 8].

First of all, the present – day education kind or type is being defined by the educative – educational system, under the conditions of which the man is receiving his education, and it is substantially and purposefully depended on the human activity types that set mastering quality, and possibly on the occupation, which are being opened the educational system specific character, and also on the science and the technology achievements cultural values and the treasures mastering quality. This is being explained by the fact, that all the educational Institutions and the educative establishments are being concentrated the developed scientific knowledge bases and the sociocultural man's activity superior standards of their epoch [3, 7].

Thus, the general education has been come into its existence, with the cognition and the learning development, with the knowledge on the nature, the society, and the man accumulation by the mankind, with the gradual knowledge role rise in the most general labor activity types implementation, side by side with such specific education type, which afterwards becomes to be named, as the occupational one. The general education, to an even greater degree, has been becoming the education leading type, the knowledge on the native nature quantitative accumulation by the mankind in the process, therefore, it is no mere chance, this education traditional type (e.g. the general one) is being considered, as the «fundamental (e.g. the general scientific and the general cultural) education» in the basic curriculum [2, 9].

In the final analysis, the education is being promoted not so much the mental abilities, the man's thinking activity and his mental activity further formation and the development, as his cognition and his consciousness development, on the whole, the character and the level of which are being defined the efficiency, as the cognitive, well as the labor and the work activity.

So called «the second nature» has been created, with the general education role strengthening in the direct practical activity implementation, with the machinery and the machines advent and their further development in the mankind public production, side by side with the nature laws learning and the cognition deepening. Its own specific and the peculiar laws and the regularities, the learning and the cognition, and the

use of which has been promoted the public production efficiency rise in the direct practical activity, have begun to be appeared just in itself with this second nature further development (e.g. the nature, which has been created by the man) [7].

The education is quite able to be considered, as the sociocultural phenomenon, the practice and the scientific investigation object, and also, as the social practice link.

It is so significant to know the education whole system specific character at the country, the specific region, and the separate educational Institution and the establishment level just from the practice position. So, this kind of the specific character is being revealed in the education models, in the educational aims, the education content, the received education forms, the types and the quality [5].

So, the aims and the content, as the every type constituent system and the education level are usually being defined by the state policy, and they are being revealed just in the educational standard, and they are being concretized in the real educational process at the every educational system and the every academic subject and the corresponding discipline level [6].

The education fruitfulness is usually being defined by the aims and the educational standard realization degree, by the type, by the quality and also by the education level.

Thus, the man has constantly been including in the self – educational process throughout the whole period of his life, side by side with the education, as the purposeful and the goal – directed, and also the specially organized teaching, the upbringing, the education, and also the training process under the specific educational system conditions [4, 5, 7].

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*Short Report***FUNDAMENTALS OF CHEMOMETRICS  
IN QUANTITATIVE ANALYSIS**

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The article describes a new computer program that enables students to make mathematical processing of research results or laboratory works in interactive mode, and empowers the supervisor to implement monitoring of laboratory work in all the research and educational groups.

Processing of results, evaluation and control of capability of data and permissible errors reproducing, comparison of series of quantitative determinations by chemical and instrumental methods of analysis, mathematical interpretation of linear and nonlinear relationships in the experiments, multilevel modeling of physical and physical chemistry parameters, and etc. are impossible without computer technology. This part of analytical chemistry is called Chemometrics.

At present, the higher education system focuses on students independent work and distance learning, and also to monitoring the implementation of this type of work. We believe the elaborated calculation and monitoring program can help in solving the above said problem not only for part-time or distant learning students, but mainly for full-time two-level training (bachelor's and master's degrees) students according to the Bologna agreements in the field of education.

We have developed a program to control two-stage implementation of student laboratory works on chemical (volumetric and gravimetric) methods of analysis and evaluation of a teacher using a particular algorithm, the results of each student's experiment. It is a series of subprograms, each of which corresponds to one particular laboratory work (16 works in total).

At the beginning of the program the student opens the file of the group, finds his/her name in the list of educational group and selects the number of laboratory work in the general registry, starting an in-

teractive mode. The program asks the student his/her experimental and calculated data in laboratory work, produces separate calculations, compares the data obtained and previously introduces ones to the computer program by the supervisor. In addition, if the difference between the data calculated by the computer and introduced by a student exceeds the allowable difference, the program signals a student an error in calculation or in experiment (e.g., in calculating the characteristics of the mixed solutions), and stops its work in this unit.

If the differences are insignificant, then depending on the relative error of calculation or experiment (the magnitude of which is varied by a supervisor, for example, from 5.0 to 0%), the program asks for data on the fulfilled laboratory works.

On the next stage the subprogram, connected with the quantitative determination of substances in the test sample or a model, gets involved. It compares the data stated by a student with the previously introduced ones by a supervisor. For the data not exceeding the allowable limit, the program signals "the work credited" and it shows an adequate mark on the monitor (from 3.00 to 5.00) for the laboratory work done.

Thus, the student can independently find out how well he made laboratory work.

While working with the program a separate file for a teacher (the supervisor of the practical work) is simultaneously created. It records the name of the student, the time of computer operation, the title of the laboratory work, the data introduced and obtained by a student, the magnitude of relative error and the mark. The teacher controls all the stages of the student's calculations and results with the developed program and monitors the students' laboratory works in all the educational groups.

This method and computer program are tested during several years in carrying out laboratory works and experiments by students of various technological and environmental disciplines and is appreciated in higher education training.

**PROBLEM OF REALIZATION OF THE RIGHTS TO COMPENSATE  
HEALTH INJURE CAUSED BY WIDESPREAD TECHNICAL  
ACCIDENTS IN RUSSIA AND THE USA (COMPARATIVE-LEGAL  
ANALYSIS)**

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The concept of the article includes comparisons of realization one of the basic ecological human right to compensate the injured or property losses due to environmental law violation in the countries with various directions of ecological policy, such as Russia and the USA. According to its practical importance, this environmental human right is in fact a way to protect the favorable environment.

**Keywords:** environmental human rights, the human right to the favorable environment, the human right to compensate the injured or property losses due to environmental law violation, toxic and environmental disasters, environmental mass torts and class action.

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In the International Law, the National Law of most states and in the scientific-legal doctrine a system of the basic environmental rights has been established. It consists of the rights to the favorable (healthy) environment, the right to have an access to environmental information, the right to participate in environmental decision-making, the right to appeal against the decisions accepted as well as the right to compensate losses caused by environmental mass torts. And the general law for all the legislation systems is the right to live in the favorable environment which appears to be fundamental, the other environmental regulation are used to guarantee this law implementation.

Environmental human rights must be consolidated in the legislation. This problem is been discussed in the literature. But some authors does not consider the right to the favorable environment to be included in the legislative acts because this right can be realized by the other environmental rights, i.e., the right itself is a declaration.<sup>1</sup>

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<sup>1</sup> Boyle A, The Role of International Human Rights Law in the protection of the Environment // Boyle A, Andersen M. Human rights approaches to environmental protection (Oxford, Clarendon press, 1998). P 43-49; Douglas-Scott S. Environmental rights in the European Union – Participatory Democracy Or Democratic Deficit? // Op.cit.P.109-128.

According to its practical importance the human right to compensate health injure or property losses caused by environmental law violation is in fact a way to protect the favorable environment. Its effective realization is of great importance based on the data obtained 20-30% of population diseases are directly related to the provoking environment contamination. So the human right to compensate health injure caused by the environmental law violation is an urgent problem today.

The mechanisms of the rights realization are quite different. It depends on the law systems of the state. In the Anglo-American law system based on the law followed by the juridical practice some certain cases on damage compensation caused by various mass torts including environmental law violation are presented.<sup>2</sup> Alternatively the Continental law system is based on the following concept: the right is the law on the people behavior on the basis of which juridical practice is formed.

In the states of this law system the legislative principles of health injure and property losses compensation are included into the civil legislation acts. The Russian Federa-

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<sup>2</sup> Lunney M, Oliphant K. Tort law. Text and material (Oxford University press, 2003). P.2

tion is a state of the Continental law system where the certain legal problems associated which the realization of the civil rights to health injure compensation caused by immense technological accidents have existed though the rights is based on the Constitution of the Russian Federation (a.42). In accordance with the general law, health injure and property losses are compensated on the bases of the clauses of the civil legislation which, in its turn, is based on the Civil Code of the Russian Federation. Nevertheless, compensatory payments to those people suffered from environmental disasters are appeared to be an exception to the compensation law. For the compensatory payments to be given the size of the disaster should be defined. But it is hard to be done. So the people suffered are paid some fixed sums from the state funds or they are given some social benefits. According to the previous experiences those kinds of payments are used in case of immense industrial accidents, extreme situations resulted in victims, mass diseases, property losses or natural objects damage on the large territory. Environmental damages caused by the accidents in the past are compensated in the same way. This kind of compensation is paid to those who injured because of the accidents only in case of the direct law which includes the according clauses on benefits and payments. The situation must be considered by the authorities and the suffered must be paid according to the event happened. In the case mentioned above it is the state that compensates the health injure and property losses considering the territory and the number of the injured. The compensation cannot be paid according to the civil or any other branch of the legislation.

Environmental disasters, heavy technological accidents affected the life and health of a great number of people, the natural and juristic people property, the state and the environment are referred to as mass torts in the juridical literature.<sup>1</sup> In some legal system, particularly in the system of the USA bring-

ing some services to trial for civil law violation, or mass torts, is positively considered, i.e. there is a certain category of cases, named «mass environmental torts».<sup>2</sup> Cases on compensation for being injured due to toxic or environmental disasters or pollution in any region are related to this category.

Russia could not avoid consequences of mass torts either. And it should be mentioned that compensations is paid out within the limits of social maintenance and social insurance but not by the civil law. Constitutional Court of the Russian Federation established the present situation as follows: as damages caused by heavy disasters are uncountable and hard to be made up, the task of the state is to define the size and the order of the compensational payments the injured may not give proof of the health harm. By today a different compensation order is established by the law on radiation accidents considering several n-accidents in the past as well as by the law on extreme situations (Federal Law «On social compensation of the citizens being irradiated due to the accident at Chernobyl Nuclear Power Plant», 1991; Federal Law «On rehabilitation special programs of Radioactive contaminated territories», 2001). Recently the Russian legislation has been changed due to ratification of the Convention on Civil liability for Nuclear Damage. According to those amendments in case of accidents another compensation mechanism is to be used on radiation hazard objects in future. Civil liability of the organization is limited in the size of the specially organized fund and the Government of the Russian Federation must compensate losses and harm if the limits of the organization are exhausted.

The problem of mass torts can be considered from the procedural point of view. In the legislative system of the USA so-called class actions are widely used. In case if the action is proven to be class action the process

<sup>1</sup> Mozolin V.P. Civil Law. Moscow. 2005. P. 338.

<sup>2</sup> Fleming, John G. American Tort Process. London. 1988. P.6-14; Fleming, John G. Mass Torts. // American Journal of Comparative Law. Vol.XLII.1994. P.508-509.

of harm compensation has some peculiarities. They are as follows: all the injured are paid the compensation no matter if their names have been included into the action for damage or not. One of the conditions for the action to be considered a class action by the court depends on the fact how heavy the disaster is. So mass torts and class actions are appeared to be dependent: a mass tort can be referred to as a reason of the class action, which is the consequence of mass torts.

Unlike an individual action, to meet a class action means to recognize law violation considering the companies which have not been joined the claim. Thus, class action are often made not only for being satisfied but for being unjuridically settled. It is rather hard to speak in what areas claims appear and make a list of them due to the fact that mass torts as well as class actions may occur in different areas. So, class action have been made in the field of computer technologies (well-known claims against Microsoft), so-called «pharmaceutical cases», «environmental cases» and others. The Civil Legislation of Russia does not deal with class actions. Such cases should be considered by the institution of procedural participation.

Procedural participation is carried out if the subject at issue is the rights and duties of general-purpose, the same foundation. The main difference between the procedural participation and the class action lies in the following: the class action satisfaction is beyond the limits of the procedural participation and includes the personalities who have not signed the claim but were injured.

So it should be concluded that the claim on damage compensation at extremely dangerous objects cannot be satisfied by the existing legal system, but it is quite possible to be carried out by west law system. There are two quite different opinions on class actions introduction into the Russian law institution. In Russian juridical literature those who are «for» consider civil cases to be taken into account more effectively and satisfied. Those who are against consider class action to provide raiders.

In our opinion class action in Russian law system must exist. They can be effectively used in realizing the right to damage compensation at ecologically dangerous enterprises. The law to make class action guarantees the total compensation for the injured resulted from heavy technical accidents and disasters.



## TAXATION OF INCOME OF INDIVIDUAL ENTREPRENEURS FROM LEASING OF PROPERTY

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The basic structure of small business of Volgograd region is presented and analyzed in the article, which is common for all fields of economy of Volgograd region.

Great attention is paid to the taxation of income of individual entrepreneurs, operating as "demise". Government pays less attention to rental market. This segment of the economy needs innovations in tax administration and modification of tax measures.

As the state support and the legalization of self-employed in the demise such method as a simplified system of taxation based on the patent is proposed by the author. The methodological and theoretical aspects of the nature of income taxation on the basis of a patent are touched upon in the article, analyzed the experience of the region in which the system of taxation has been applied since 2006, argued and justified the necessity its adaptation in the Volgograd region.

**Keywords:** taxation, income, market, rent, property, patent, rate

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The article describes the basic criteria for tax reforms and incentives for small businesses. The main provisions of the taxation of income of individual entrepreneurs are developed. Removing the income from the use of personal property can be defined as entrepreneurial activities. It means all landlords may be registered as individual entrepreneurs.

In recent years, in the Volgograd region there has been steady growth in the number of individual entrepreneurs. Today the region has about 70 thousand entrepreneurs<sup>1</sup>.

Most of the entrepreneurs engaged in brokering and providing services: 61% engaged in wholesale and retail trade, repair of motor vehicles and household goods, 10% carry out transportation (transport and communications), 7.8% - real estate operations (according to the Office of Enterprise Development Administration of the Volgograd region)<sup>2</sup>.

This kind of business as property letting is not singled out by the species, although there is no secret, that not all residents of Russia have the property, belonging to them on the right of ownership. Therefore

it is necessary on the basis of lease agreements to rent housing. Cash received from this type of service by owners of housing and often do not fall into the federal budget.

However, revenues from the use of property belonging to individuals on the right of private property can be obtained only in the case if such persons themselves carry out business activities with the use of the property. In the case of renting the landlord carries on business with the use of the rent property; according to art. 606 Civil Code of Russian Federation, and revenues received by the landlord in the use of the rent property in accordance with the contract, are his property<sup>3</sup>.

State support for small businesses and individual entrepreneurs creates conditions, in order to consolidate their position in the economy, to develop and to have positive impact on the socio-economic indicators independently<sup>4</sup>. The main type of state support is the creation of special tax regimes – special conditions opposite to the general regime of taxation of the bulk of taxpayers. Special tax regime as an organizational and financial category is particular (specific) built system of taxes and taxation for limited categories of

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<sup>1</sup> Information Agency "Alliance Media" [Electronic resource]. - Mode of access to the site: <http://www.allmedia.ru>.

<sup>2</sup> Office of Enterprise Development Administration of the Volgograd region [electronic resource]. - Mode of access to the site ([www.urp.volcity.ru](http://www.urp.volcity.ru))

<sup>3</sup> Ureva T.N. Is renting citizens property a business? [Text] / T.N. Ureva / Tax Journal. – 2004. – № 12. – С. 85.

<sup>4</sup> On the development of small and medium businesses in Russia [Text]: Feder. Act of July 24, 2007 № 209-FZ // Coll. Legislation Ros. Federation.– 2007. – №31. – 4006.

taxpayers, activities and industries, based on the single tax in any of his form and limited number of related tax payments, in order to simplify the process of taxation, fuller realization of its principles and achievements on this basis, the greatest fiscal and regulatory effects.

One way of taxation of income of entrepreneurs, operating as "renting residential property for rent is a simplified system of taxation based on the patent. It is kind of simplified taxation system. The purpose of its introduction is supporting and legalization of self-employed population. This rule was introduced by the Federal Law of 21.07.2005 № 101-FZ "Making changes in Chapter 26.2 and 26.3 of the Tax Code of Russia and some legislative acts of Russia on taxes and fees, and the Repeal of certain provisions of legislation Russian Federation". Simplified tax system application on the basis of patent is not mandatory – individual entrepreneurs decide to transit to this system of taxation, they can pay taxes in a general way. The new tax system is fundamentally different from the previously operated and is built on the principle of imputed income, that is not dependent on the outcome of the taxpayer, and in this sense is close to the system of taxation in the form of unified tax on imputed income of individual entrepreneurs. Patent value is linked to the potential possibility to obtain an annual income of an individual entrepreneur, which is determined by calculation.

The transition to the use of individual entrepreneurs Simplified tax system on the basis of a patent on the territory of RF subjects carried out according to the laws of the relevant subjects of Russia, who have the right within the list given in the Tax Code, to determine the types of entrepreneurial activity, which allowed the use of individual entrepreneurs Simplified tax system on the basis of the patent, as well as the size of their potential annual revenue.

Based on the foregoing, it can be concluded that in order to entrepreneurs who wanted to work on the basis of a patent, they must meet four conditions:

1) At the individual entrepreneur who wants to obtain a patent shall not be employees working under labor or civil contract;

2) Individual entrepreneur must deal with one of 58 types of activities referred to in paragraph 2 of Art. 346.25.1 Tax Code;

3) Authorities of the RF subject, which employs an individual entrepreneur, should take appropriate law;

4) Individual entrepreneur shall be registered in the tax office to which he applies for one month before the start of work on the simplified system of taxation based on the patent application.

In addition, individual entrepreneurs who crossed over to the simplified taxation system based on the patent, must also comply with general conditions of the simplified system of taxation on marginal income and cost of fixed assets and intangible assets, which are governed by relevant rules of law. If an individual entrepreneur violates the above conditions, then he loses the patent and passes to the general taxation regime.

Since individual entrepreneurs, who bought the patent, do not pay the single tax, they have no duty arises to fill the books of income and expenditure, and therefore they should not pass the tax return.

Analysis of the legislation suggests that the payment of patent replaces the following taxes:

- single tax on income or the difference between income and expenditure;

- income tax for individuals and the unified social tax on income derived from business activities;

- property tax, applicable to business;
- value added tax, excluding value added tax, related to the importation of goods into the customs territory of Russia.

Patent is a fixed amount paid by the individual entrepreneur for the right to be engaged in certain activity. The annual cost is equal to the patent's potential annual income of the taxpayer multiplied by the tax rate. This tax rate is recognized rate applicable in accordance with the existing law on simplified taxation system for individual entrepre-

neurs, the selected object of taxation in the form of income, i.e. 6%.

If the type of business allowed for the possible use of the simplified taxation system based on the patent, is included in the list of the types of entrepreneurial activity, set item 2 of article. 346.26 Tax Code for a single tax on imputed income, the amount of potential annual revenue for this type of business must not exceed the value of the base yield set for the respective type of Chapter 26.3 of the Code, multiplied by 30. Thus the benchmark return is by definition the conditional monthly, rather than annual income in terms of value for a particular unit of physical indicators, that is, an increase of potential annual income can not be greater than 2.5 times compared to the benchmark return on a single tax on imputed income is calculated on a year for one unit of physical activity index<sup>1</sup>.

Simplified tax system based on the patent for the activity as "renting the apartments" only introduced in some regions of Russia: Kaliningrad, the Republic of Buryatia, Perm Krai, Komi Republic, Primorsky Krai, Krasnodar and the Krasnodar Territory,

Samara Region. The criterion for determining the annual cost of a patent is the size of the annual cost of renting an apartment with a view of features and places of business. The main features are the geographic location of the dwelling, the population in the settlements.

The problem of taxation of income from lease of property can be solved with the application of the patent in all regions of Russia and will serve as an additional source of the budget.

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## LONG-HAUL TRADE IN THE NORTHERN KAZAKHSTAN IN THE SECOND HALF OF THE XVIII CENTURY

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The article reveals the essence and methods of colonial policy of the Russian Empire in the trade development in the northern region of Kazakhstan in the second half of the 18-th century. The analysis of the linear trade's condition proves shows that it served as an effective instrument of colonization and promoted economic consolidation of the region as a member of the Empire.

**Keywords:** January, February, March, December, happiness

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After completing the building of Novoishimskaya line, which had connected the northern Kazakhstan with Ural and Irtysh, and as a result with Central Russia, there were established conditions for making a settlement of forest-steppe regions of Kazakhstan by Russians.

For the final fixation of Russia in the northern region of Kazakhstan there was not enough a military footprint, there was also the necessity of its agricultural reclaiming and including it into the internal market of Russia.

While solving a very important strategic task that concerns the insertion of Kazakh steppes into Russian empire structure by means of creation the net of military Cossack fortifications, Russia also needed an economic provision of new serf lines. Moreover, the necessity of the market to sell off its goods, as well as the cheap sources of raw materials and the prospects of the economic community with China and Central Asia increased the role of the flat trade in this region. The trade played a great role in the policy in the relations with Kazakh rulers.

The effective way of colonization was a long-haul trade that not only strengthened the economic links with the steppe and that was ministerial to the penetration of the other way of life through items of material culture, but it also solved the real-world problems: the replenishment of governmental treasury due to customs duties and supporting the lines with a provision.

At the second half of XVIII century in the northern region of Kazakhstan it was pos-

sible to assign two main trade centers. The are: Orenburg –Troitsk and Petropavlovsk.

The center of trade in the middle of XVIII century was Orenburg, which had “the shopping arcade with 150 small shops, and at steppes, not far from the city, there was the Exchange arcade with 148 storehouses and 344 small shops; the shopping arcade was used for autumn and winter trade and the exchange arcade was used to summer trade with asians”. (1) The main items of trade in Orenburg were cattle and bread, the sail of which form 1745 to 1759 had averaged about one million of rubles. (2) The governor of Orenburg reported to Ekaterina II that “Kirghiz people came to the exchange in a big quantity, sometimes there could be exchanged 14 thousands of rams...” (3) So the barter trade in Orenburg had a big value and provided a benefit to merchants and governmental treasury.

In 1753 there were approved the rates goods taxes (these goods were brought to Orenburg and Troitsk), then there appeared the regulation for a boundary trade and there were opened the salt shops. The Government demanded the checkup and the security of the trade with the nomads. According to all these documents all Kazakh people who came to Orenburg, Orsk and Troitsk for a barter trade had to hand over their weapons in the custom house. The shops were supposed to have special military orders.

The barter trade in Orenburg became very popular and it made large profits to the merchants and to the state treasury. The governor of Orenburg I.I. Neplyuev gave an incentive to this kind of trade while using dif-

ferent ways: he invited Russian merchants to commerce in Orenburg; in order to attract Kazakh khans to the goods he gave the different presents such as flour and cereals; he allowed 200 families of trade Kazan Tatars to move to Orenburg. He also used the violent ways. So, in 1744 thanks to his petition and the Senate decree all the merchants that were supposed to be resettled to Siberia for their crimes, they were sent to Orenburg. Those people who made the commerce in the wrong places and without the government permission, were punished.

I.I. Neplyuev forbade to make commerce with Kazakh people in the wrong places, though Ablai and «people who supported Russian empire» (the foreman of the middle horde Kulsars and Kulyaks, who lived close to the trade lines) asked about the permission to sell of their goods at these places. He offered to send Kazakh people who wanted to make commerce to Irtysh to Yamyshevskaya and Semipalatinskaya regions because the trade was permitted there and there were a lot of merchants with the goods.

It's necessary to point out that the urge of Orenburg governor I.I. Neplyuev to control the trade in this region was like an obstacle to its development in the new territories and it blocked the economic developing of the nearest territories.

Orenburg and Orsk didn't provide the population with goods in enough quality and they didn't cover all Kazakh stocks and tribes of the whole northern region.

As far as a military consolidation of new lines grew up and there appeared the purpose of strengthening the influence of power on Middle Zhuz that sultan Ablai longed for and whose loyalty the authorities were interested in, there was opened the barter trade with Kazakhs in Troitskaya fortress. For the most part Kazakhs bought bread, paper and metal products, manufactory products, tea, sugar, offering instead their cattle and products of cattle-breeding. The goods of economic culture were as the guard of Russian way of life into the Kazakh steppes and

they also destroyed the traditional way of life. That's why the collegium of Foreign Affairs supported the «the put of bread from that side to the foreign countries», because they supposed that «Asiatic people ate only meat and milk earlier, but now they began to buy bread and that they will get pluses because of bread».

The efficient geographical position of Troitsk that was situated in the intersection of Russia, Siberia and Kazakhstan caused the importance of its role in the trade in the east of Russian empire. The evidences of it are the following: the establishment of the direct commerce way from Siberia to the Troitsk fortress; then the appearance in Troitsk barter market of Moscow, Tyumen, Putibl, Urzhumsk and other merchants, who wouldn't go so far if it was not profitable; then the permission since 1753 to make a commerce in Troitsk fortress as well as in Orenburg; it increased customs duties; the transformation of Troitsk fortress promoted the development of the barter trade

The barter trade of Troitsk showed an effectiveness of long-haul trade, its important role in supporting of Russian influence on Kazakhs. That's why there was opened a barter trade in Petropavlovskaya fortress and then in Presnogorkovskaya fortress in 1766. Both sides held an interest in opening of long-haul trade in Novoishimskaya line. We can find a proof in correspondence of the representatives of colonial authorities and in Kazakh gentility. For example, Ablay sultan addressed to lieutenant colonel P.Roden, who was the commander of Uyskaya military line in 1759: "my nation and I ask you to let Kyrgyz people exchange flour and grits in Saint Peter fortress". (4)

The result of the petition was the establishment of Petropavlovsk commerce, which was observed by the commander of Siberia corps I.I. Shpringer as the powerful procedure because it provided Russian government with a wide rode to the steppes. In order to encourage the trade in the territories in 1764, the government made a decision to assign some money for the treatment of the comers



to the territory of Kazakh people and Central Asiatic merchants.

The trade in Petropavlovsk began successfully and its transactions in the first years gave extraordinary results. Among Russian merchants there were more ones from Siberia: Tobolsk, Tyumen, Tara. There also appeared the merchant from separate cities: Kazan, Tula, Kursk, Voronezh, Archangelsk. Sometimes there could be more than 100 merchants. Bukhara and Tashkent merchants went from Central Asia. The number of Kazakhs who came during one summer month could be from 500 to 650 people". (5)

In the trade of the territories there prevailed the barter character, but not a financial one, because while making commerce the Kazakh people couldn't notice the non-equivalence of barter. The merchant established the necessary equivalent. For example, he could get a horse for seven arshines of blue broadcloth; for three arshines of the same broadcloth he could get a horse or for 14 arshines – 3 bulls. For two cast-iron boilers, a trivet and two bowls – two horses and one bull; for 80 clay bowls – a horse; it was possible to judge according to the following correlation: 25 arshines of a linen cost at that time 75 copecks; but a horse or a bull cost 7-8 rubles. The prices were spontaneous. Russian bought the pood of a beef for 40 copecks, a ram for 20 copecks, but they sold the pood the rye flour for 90 copecks. The horses of Kazakh people cost from 1, 5 rubles to 13 rubles, but in Orenburg it cost 15 rubles and more. So, at the beginning of the XIX century in Petropavlovsk custom house there were almost 84% of the whole cattle from Kazakhstan.

The prices for bread were also low, but it was caused by the policy. «It was supposed to sell bread to Kazakh people for low prices because they could have their own crops later and then they could become independent from the Russian influence and they had a chance to make good contacts with Hive and Bukhara who had the same believes».

There was also damage to the trade because of so-called privy commerce, which

provided with goods only the population of these territories. That's why the government that was an interested party in large profits, assumed some measures. In 1782 there was issued an edict of the Senate concerning the establishment of the custom-house chain and the necessity of the guards to stop the veiled export of the goods to the foreign countries. In 1784 the commerce collegium made a decision to give Petropavlovsk the functions of foreign trade (the conditions with Kyachta were the same). By the end of the XVIII century the commercial transaction achieved great results and it remained only behind Kyachta.

The turnover of the long-haul trade intensively involved northern regions of Kazakhstan into the market relations. Russian merchants were allowed to go out the line to steppe and the itinerant trade became a leading one. F.Helmolgz describes the conditions of itinerant trade: "the merchant who was going to the steppe loaded his cart with "the Kyrgyz goods" (it means bad goods which can not be sold in the city, such as cotton, tea, bad sugar) i.e. the goods had the worst quality and the lowest value. The merchant is traveling until the last good is sold. Goods were very expensive. A half of pound of tea and a pound of sugar cost a ram which price was 3-4 rubles. The merchant, when he was exchanging the goods, doubled the price but the price of Kyrgyz's good was reduced twice. Also they cheated nomads who did not know the measure. " (6) Soon there appeared fairs in the steppe, for example Tainchakulskaya fair near Petropavlovsk. B.Zavalishin historian marked that "Petropavlovsk is the most important point of our trade with the West China and the whole Central Asia, not only on the Siberian line, but also on Orenburgskaya one." (7)

The development of trade caused the appearance and the development of the production plants (in 1816 by the merchants of the second guild Ivan and Yakov Bolshakov there were opened the tallow-melting and leather-dressing plants), but in 1849 in Petropavlovsk there were opened 7 tallow-

melting plants, 7 leather-dressing, 4 soap works and 17 brickworks.

All this led to the transformation of Petropavlovsk from the fortress to the city at the beginning of the XIX century, because it had an economic significance in the northern region of Kazakhstan.

The whole system of trade and economic relations played a great role the stabilization of the political climate in the region. The controlled trade in the fortifications made great profits to the Russian treasure and the merchants, and it also satisfied the requirements of the nomads in the goods and pulled them into the empire.

The analysis of long-haul trade condition in the northern region of Kazakhstan in the second half of XVIII century shows that it was an effective way of colonization and promoted the economic consolidation of the region in the empire.

The politics of social assimilation, military-civil colonization, long-haul trade

strengthened economic and politic links of Russia with the steppe and at the same time they destroyed the nomad way of life, changed social structure, promoted the “absorption” of earlier free state and transformed it into the colony of Russian empire.

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## Materials of Conferences

**HUMAN CAPITAL AS THE FACTOR  
OF THE MAKING MORE ACTIVE  
OF THE INNOVATION DEVELOPMENT**

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In the contemporary society human capital is the determining factor of growth and economic development. Public health is the most important sphere of the market economy, in the process of activity of which occurs the restoration of human potential for the expanded reproduction by redistributing the temporarily free cash resources of all participants in the reproductive process - state, the economic subjects and population.

Public health, demonstrating during the last few years the high rates of development and the specific stability of functioning, acquires the gradually new qualitative level, characteristic of the subjects of the market system of relations. The development of medical science and pharmaceuticals becomes one of the most important tasks of the modernization of the domestic economy.

Meanwhile under the conditions of world financial crisis, the important significance have problems of financing public health. Their substantial part is connected with the serious deficiencies in control of the finances: making administrative decisions without their necessary economic study; the absence of systems approach in the realization not only tactical missions, but also of strategic purposes of development; the underestimation of the role of innovations and market technologies of control of financing.

The market economy manufactured the extensive system of financial methods and market technologies on the innovation basis. These methods make it possible to reveal at the early stage and to remove the negative factors of development, to outline the basic directions of improvement.

Analysis of the system of financing the sphere of public health is impossible separately from the theoretical-methodological and practical developments of the domestic and foreign authors. At the same time, it is necessary to note that the foreign experience is now and then seldom applicable to the conditions of the contemporary Russian economy, or it needs essential adaptation.

The reasons pointed out above led to the updating of the problems, connected with study and improvement of the system of financing the sphere of public health on the innovation basis.

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**TO THE QUESTION OF CREATING  
COMPLEX SYSTEM OF MARKETING  
LOGISTIC CONTROLLING**

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In contemporary conditions of management researches dedicated to perfection of methodic approaches in sales administration are especially important. As the aim to increase sales result under the condition of financial crisis is responsible for a great quantity of problems, centre goal of which is to find priorities in management that will answer condition and tendency of marketing development and that are based on strong sides of a company.

In this regard, creation and development of complex system of marketing logistic controlling (CS MLC) appears an important factor of further increase of work efficiency. In author's point of view, a complex approach for information system formation, including profiles "production" and "economics and finances" is necessary to come to a decision in CS MLC.

Creation and implementation of CS MLC supposes fulfillment of five important functions:

- sales planning, canvass;
- end product stock management;
- sales budget approval;
- scheduling production and shipping of commodities and materials;
- sales and logistics controlling;

The most perspective branch of companies' sales logistics is formation of CS MLC on the basis of CRM system (*consumer relationship management*), which includes consumer relationship management tools.

Special attention is given to the strategy of product stock management that includes:

- 1) budget planning;
- 2) "sales manager reserve" management according to the market character: keeping minimal value of reserve at a "falling" market and maximum at a "growing" market;
- 3) choice of strategic clients depending on consumer category estimation according to the following factors: volume of purchases, due day failure, cooperation period, "profitability" per hour, constancy of monthly volume of purchases.

In conditions of growing market the choice of consumer category allows receiving maximum profit. In conditions of falling market and financial crisis applicability of this method doesn't lose as it allows optimizing machine load while making of production program.

All company's expenses connected with organization and function of CS MLC, in author's opinion, may be defined the following way (1,2):

$$E_{MLC} = E_{Tr} + E_{DI} + E_S + E_{DC} + E_{C\&O}, \quad (1)$$

or

$$E_{MLC} = A_{MLC} + M_{MLC} + W_{MLC} + WT_{MLC} + S_{MLC} + T_{MLC} + PM_{MLC}, \quad (2)$$

where  $E_{MLC}$  - expenses for the complex system of marketing logistic controlling;  $E_{Tr}$  - expenses for transactions (search of new consumers, new contracts formation);  $E_{DI}$  (... for definition of income) - expenses for sales volume estimation;  $E_S$  - expenses for storage of commodities and materials;  $E_{DC}$  - expenses for delivery to the consumer;  $E_{C\&O}$  - expenses for the control and optimization of CS MLC;  $A_{MLC}$  - amortization, the integrated process of procurement;  $M_{MLC}$  - material cost necessary for CS MLC;  $W_{MLC}$  - wage of those who work in CS MLC;  $WT_{MLC}$  - wages tax;  $S_{MLC}$  - services from third-part companies necessary for CS MLC;  $T_{MLC}$  - taxes and other similar payments necessary for

CS MLC;  $PM_{MLC}$  - payments that can't be related to any of the above expenses necessary for CS MLC.

We should mark that the expenses amount necessary for CS MLC ( $E_{MLC}$ ), determined by functions (see formula (1)) or by cost items (see formula (2)) allows getting the same dependence on business scale of the company.

Taking into consideration that the main aim of CS MLC is decreasing logistics losses while realizing products, goods, services. In absolute terms the result of CS MLC functioning is represented by logistics losses decrease (3):

$$R_{MLC} = L_0 - L_1, \quad (3)$$

where  $R_{MLC}$  - is a result of CS MLC functioning;  $L_0$  - losses without CS MLC;  $L_1$  - losses with working CS MLC.

Without regard to investments for CS MLC creation company's economy from its implementation represents difference between CS MLC functioning result ( $R_{MLC}$ ) and cost of its support ( $E_{MLC}$ ) (4):

$$Ef_{MLC} = R_{MLC} - E_{MLC}, \quad (4)$$

where  $Ef_{MLC}$  - is efficiency of CS MLC.

Obviously, application of CS MLC will be profitable only in case the result of its functioning will pass the cost of its support  $Ef_{MLC} > 0$  or  $R_{MLC} > E_{MLC}$ .

We should mark that it is more difficult to organize CS MLC in holding companies while creating it we should take into consideration not only industry characteristics, company's size and range of its activity but also other factors, due to occurring integration processes.

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#### THE MODIFIED MODEL OF DISTRIBUTION SPEED OF INDIRECT ADVERTISING IN CONDITIONS OF AGING OF KNOWLEDGE

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The advertising of the various goods and services plays an appreciable role in a modern information society. However, not all knowledge of the consumer of the goods or service received by advertisement represents value for him. One of the important reasons of this phenomenon is the tendency of aging practically of any information due to factor of a time.

Such specific properties, as intangibility, namely absence of the material form up to the moment of realization, and impossibility of keeping are typical for the services [1].

The models of process of indirect advertising usually are based on the following basic assumptions [2, 3].

It is considered, that the speed of change in the time of quantity of the clients knowing about the object of advertising and ready to its purchase, is proportional to both quantity of buyers knowing about it, and quantity of buyers, not knowing about it. Also it is supposed, that to the moment of the beginning of process the some part from the total of the potential buyers already knows about object of the advertising.

Also a degree of dialogue of the buyers among themselves plays important role, influencing on the time and the speed of distribution of indirect advertising in the mentioned models.

$$\frac{dN(t)}{dt} = \alpha N(t)(N_0 - N(t)), \quad (1)$$

where  $\frac{dN(t)}{dt}$  is the distribution speed of indirect advertising,

$\alpha$  is the degree of dialogue of the buyers among themselves,  $\alpha > 0$ ,

$N(t)$  is the quantity of the clients knowing about the object of advertising to the moment  $t$ ,

$N_0$  is the total quantity of the potential buyers,

$(N_0 - N(t))$  is the quantity of the clients, not knowing about the object of advertising to the moment

According to existing representations [2, 3], analysis of speed of distribution of indirect advertising is based on the differential equation of the first order:

$t$ ; at the initial conditions  $N(0) = \frac{N_0}{\gamma}$ , where

$\gamma > 1$ .

It was suggested in [2] to determine the value  $\alpha$  by means of the interrogations.

However, the other possible approach is based on the existing formula of change values of any information in the time, including information received by indirect advertising.

Value of the information in the time tends to decrease, according to the dependence [4]:

$$C(t) = C_0 e^{-\frac{2,3t}{\tau}}, \quad (2)$$

where  $C_0$  – value of the information in the moment of occurrence or reception ( $C_0 = const$ );

$t$  – time from the moment of occurrence of the information up to the moment of definition of value;

$\tau$  – time from the moment of occurrence of the information up to the moment of the aging ( $\tau = const$ ).

As it is visible from the earlier considered equation (1), the speed of distribution of indirect advertising is directly proportional to a degree of dia-

logue of the buyers among themselves. The mentioned degree is the some coefficient of the proportionality. Considering, that on the average degree of dialogue of the buyers with each other about the goods or service is completely defined by value of the advertising information about object of advertising, we shall come to the following modified model of speed of distribution of indirect advertising:

$$\frac{dN(t)}{dt} = C_0 e^{-\frac{2,3t}{\tau}} N(t)(N_0 - N(t)), \quad (3)$$

where the designations are coincide with specified in explanations of the formulas (1) and (2).

Within positions of sociology and marketing the research of time and speed of distribution of indirect advertising is of interest at various initial value of advertising information and at various periods of time, during which the advertising information has a value.

The considered equation (3) is the differential equation with dividing variables, with the non-zero initial condition. The analytical solution of the specified equation gives in result the particular solution, which is suitable for the analysis:

$$N(t) = \frac{N_0 e^{-\frac{2,3t}{\tau}}}{e^{-\frac{2,3t}{\tau}} + \gamma - 1} \cdot \frac{C_0 \tau N_0 \left( 1 - e^{-\frac{2,3t}{\tau}} \right)^{2,3}}{C_0 \tau N_0 \left( 1 - e^{-\frac{2,3t}{\tau}} \right)^{2,3}}$$

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## THE ACCOUNTANCY THEORY IN THE 21<sup>st</sup> CENTURY

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In the end of the 20<sup>th</sup> – at the beginning of the 21<sup>st</sup> century, the interaction processes with the other sciences, so called «the synergism effect» have been become the accounting theory development character and the typical indication, when the data integration from the various and the different knowledge fields is being permitted to be created the new theory, which is quite impossible in the framework of only the one science. So, the economic theory, the management theory, the information science, the cybernetics, the philosophy, the sciences have already rendered the special influence upon the accounting theory development.

The challenge on the scientific theory choice on the basis of the efficiency criterion has been considered after the economic theory in the accountancy.

The enterprise profit maximization has been appeared, at the beginning, as the special – purpose target. The two theories have already been suggested in the framework of this direction – *the continuously contemporary accounting (CoCoA) and the replacement at the price of the accounting (RPA)*. So, the utility principle for the decisions making, having formulated in the economic theory, has been used in these oriented – marketly theories. The existing differences in the assumptions and the suppositions on the companies' existence targets (e.g. CoCoA – to be adapted to the constantly changing conditions, RPA – the activity continuity) will be resulted in the various and different types of accountability formation (e.g. CoCoA – the appraisal at the net price realization, RPA – the appraisal at the replacement price, the assets acquisitions).

Later on, the approach has been suggested by the American Rochester School, at which all the business participants profits maximization has been announced, as the business first and foremost target (e.g. PAT). Thus, the firm is being considered in the framework of this theory, as the evident and obvious or the implicit and the implied agreements unit between the selfishly acted sides, and it is, moreover, being considered, that «*the rational decisions making theory*» is being laid in the basis of the management choice. It means, that the persons, having accepted the decisions, are being disposing the correct and the right knowledge on the economic information, they usually are being preferred the best accessible alternative, and they are being acted quite logically, stably and invariably, and also coordinately.

And, moreover, the other newest developments in the management field have been applied at the PAT development such, as: «*the representation theory*», *the agency relations theory*. Thus, the owner is acting, in

the principal's role, and the company's business managers – in the agents' role by his errands carrying out. So, for the PAT development, the central role of the contractual expenses apportionment is quite typically in the accounting theory, in the structure of which there are, so called «the representation expenses»: the expenses for the control carrying out (e.g. for the principal), the guarantee expenses (e.g. for the agent), the residual loss (e.g. the firm's decline in value). For all this, the accounting information is being acted, as the contingency rundown factor, so, it is meant and the transaction expenses quantity reduction.

The new approach to the structure formation and the report information content, which is being connected with «the harmonious and the balanced development» theory of the firm is being formed by the experts and the specialists in the field of the accountancy under the economic crises of the last years.

The more in – depth analysis of the data on the company's economical activity on the basis of the advanced mathematical and the statistical methods and the automated data processing (ADP) is quite character and the typical for the contemporary accounting theory.

The accountancy automatization is being removed the restrictions on the accountability representation periodicity, the analytics levels rise, the normative indications and the regulatory standards introduction into the system of the accounts, and this is being made it quite possible the necessary control for the numerical indices of the great number of the isolated subdivisions in the on – line regime. The linear algebra and the modeling aids methods are being used for the accounts interconnection study. They are being suggested, as the models optimization criteria:

- the rational and the efficient essential elements and the details in the business documents, the registers, and the reporting forms;
- the optimal correlation between the registers;
- the efficient combination, as the chronological, well as the systematic recording;
- the passing way shortening of the processed information from its origin moment in the primary documents up to the balance;

The computer engineering and the programming are completely being changed the accountant's labor character, they are being permitted to apply the newest methods of the accounting teaching: the virtual games, and the courseware.

The swiftly forming academic discipline «the science philosophy» has been exerted the considerable influence upon the accountancy theory development in the second half of the 20<sup>th</sup> century. So, the contemporary classification of the accounting theories have been suggested by the scientists and the scholars:

- the bases and the grounds (e.g. the deductive, the inductive, the pragmatic ones) by the used method;

- by the role, by the theory destination (e.g. describing – the positive and the prescriptive ones – the normative and the standard one).

The necessary attempts have been taken to be applied such notions, as the verification, the falsification, the scientific and the research programs, the scientific knowledge paradigms to the accountancy theory in the light of the science philosophy achievements of the 20<sup>th</sup> century. However, some scientists and the scholars consider, that the crisis state before the accounting paradigm change is constantly being observed in the accountancy.

However, it is completely possible to be confirmed quite positively – the necessary searching are being continued in the field of the accountancy theory creation of the 21<sup>st</sup> century, and they are being exerted the direct influence and the subsequent impact upon the accountancy development throughout the whole world.

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## PHILOSOPHICAL-AESTHETIC FOUNDATIONS OF TRANSITION AESTHETICS

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This article gives consideration to philosophic-aesthetical conception of the aesthetical transformation, represented in the aspect of historic- civilized approach. There is a definition for "aesthetic of transformation", the mechanism of transition Old Russian mythologemes into modern cultural field. The innovation interpretation and the introduction of the definition "transformation" into aesthetic field allow to continue further study of modern creative work with the aid of actualization aesthetic foundation of culture. The article can become the reason for thought about further ways of modern aesthetic development.

For culturologues philosophers and everyone who is interested in modern state of world wide and native culture and art.

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Methodological and theoretical foundations of researches in transition aesthetics are the principles of cultural-typological and comparative historical analyses. Primarily the author is based on the methodology which commencement was started by Aristotle in his work "About coming into existence and annihilation" [1]. Analyzing the very idea of coming into existence he applies to the principle of cyclicity: "Thus, there is absolute necessity in movement in a circle and in coming into existence in a circle. If coming into existence is going on in a circle, then every [link] inevitably coming into existence and coming into existence takes place, and if it is necessary, than coming into existence is going on in a circle"[2]. In the work Aristotle grounds the idea of coming into existence - annihilation which later on has been spread to the laws of the cyclic development of history, the idea of transition as such: "Simple transition into non matter is a simple annihilation, but transition into simple matter is simple coming into existence [3]". And after that he goes on: "But just as they speak about simple annihilation if [something] transfers into imperceptible and non-matter, like this they speak about coming into existence from non-matter if it coming into existence from imperceptible" [4].

While developing the philosophical-aesthetic grounds of "transition aesthetic" conception the author was guided by the cycle theory for culture developed by P.Sorokin, who affirms that "the theory of

the ancient adherents of the cyclic theory, such as Confucius, Platon, Phukidid, Aristotle, Ciceronian, Seneka, Machiavelly, Vico was more scientific and grasped the reality much better than less speculative theories of "tendentious lawmakers"[5].

P. Sorokin marks out in the history the perceptive culture, the ideational culture and the third one, "which is the transitional one between the perceptive culture and the culture of the ideational type". He named it idealistic, integrated, id est the culture which came up to the certain synthesis of the former two cultures. "Here we can observe eclectics both in Sorokin's works and in the XXc. culture, and this fact defines the idea of aesthetic in it" – says N.A.Khrenov [6]. Thus, guided by Sorokin's fundamental conception of the ideational and perceptive cultures interchange along the whole world culture development, the interpretation of the "transition aesthetics" conception in home art practice of the XXc. has been shown in this work.

The cycle interchange is associated with regress, that is with coming back to the origins. "As for the XXth c. it seems we mean about coming back not only to the sources of the cycle, but to the sources of civilization in general, i.e. to the archaic character which is so active in the art at the turn of the XIX-XXc." [7].

Actualization of the old Russian culture values, especially amateur and folk arts most evidently and distinctively shows itself in the art of the Russian modernism in the

XIX-early XXc. In the XIX a keen interest in the folk cults and heresies was shown. Those times have been described as an age of romanticism, and it is characterized by the interest in secrets and life of common people. Based on the works of contemporary authors who investigate the problem in the needed vein, the author has concentrated her attention upon the artistic practice of modernism as the transition aesthetics, the synthesis of elite and traditions in the art.

The Russian religions – philosophical Renaissance, which functions were to revise “the old” consciousness, to form a new value system, to cause a certain turn in spiritual life must be admitted as an important sociocultural tendency in the early XXc.

Modernism with regard to the art, undoubtedly, correlates with the age of the collapse of the classical tradition. Renunciation of the rationalism, subjective self-absorption, pessimism and nihilism creates an affinity between the modernism art and anthropological philosophy. Standing aloof from the social and moral problems is typical for modernism. But for the classical art besides aesthetic the moral content is very important. Thus, the art of modernism breaks off with the nearest traditions of the Enlightenment and the Newtimes aesthetics.

The most characteristic features for them were: revision of the creativity grounds, destruction, fragmenting (at the initial stage) and combining, work with a sign, futuristic reflection of “negation”. The Russian modernism on the one hand was nourished on the roots of the folk art, on the other hand the desire to involve masses in the creative work went with elitism, with the intention to make an artificial world of beauty. The transition in aesthetics was formed on the innovations, through negating the fundamental principle of reflection. But, as the history of culture shows, any attempt of novation brings about many ancient cultural layers. The Ukrainian culture expert Miron Petrovskiy gives as examples of the shattering innovation poetry of V. Mayakovskiy, who actualized the medieval-Christian models, more fundamental

“willbeing” of Velimir Khlebnikov, relating to the area of the original mythology, and the “precultural space” of A. Kruchenikh in his experiments in the space of alogism and transcendent poetry.

In the Russian modernism the game principles, the stylization of ... which are the fundamentals in the postmodernism can be clearly seen. In the intellectualism of modernism the revival of traditions, classes in their new forms and subjective senses took place rather than the renunciation of them.

The Russian art nouveau “as nothing else” was painted in the national colors of the home country. At the beginning of the century icon painting was taken as a painting similar to the primitive art, as a completely museum piece, an “aesthetic underthinking and underfeeling”, and this fact, according to P. Florenskiy, prevented them from taking it as an object of worship.

From the beginning of the century much attention has been paid to so-called “the third culture”. N.A. Khrenov describes the Russian culture as a culture of obliviousness, bereavement, renunciation of traditions. – V. Pigulevskiy. Now the modern art of Russia is ready for accepting innovations as it has been before, the fact is reflected in the modern aesthetic theory on a rather wide scale. Investigating the cultural events in a vital, real, spatio-temporal continuum of the history enables to see the harmonization of traditions and innovations. The situation of the time shows the actualization of so-called “Big tradition” and “Complete tradition”, the complete tradition means that the ideal and symbolic systems are closed. The specific existence form for a tradition is art, science, religion etc.

With respect to the culture and the society a tradition is a system generating notion, it is a demiurge of a culture. So, in this sense the digression from the classic aesthetic traditions in the modern art doesn't mean to be out of touch with reality, but it shows the gap in the aesthetic theory supported by the Western classical aesthetics which emerged in the West. That's why it is impossible to reflect

adequately the realities of the aesthetic practice in the modern Russia, supported, however paradoxically it sounds, by the Russian Slavic heathen tradition.

The art practice of the postmodernism – the deconstructivism – as an utmost deflection from the tradition, shows that the postmodernism has a different “truth”, it is opposite to the former spiritual tradition and the former culture. It reflects metaphysics and conventional for that time conceptions of a human and his place in the world. The absence – of an author, a subject, a human – is a specific indication, the feature of the actual “postmodern” philosophizing. It opposes, abolishes the philosophical anthropology. Setting up the informational reality leads to the changes in the mental area, to the deconstruction of the whole of metaphysics, anthropology, and it means the rejection of the distinction between the subject and the object. A human in this situation doesn't meet the modern traditions and, according to V.Kutyrev, he himself becomes a tradition.

The theories of “the vital world” by the late E.Gusserl and L.Witgenshtein have a bent for the subject – reality unity. The postmetaphysical manner of philosophizing orientates itself to the transition from the paradigm of the objective reality to the paradigm of formation, it means that the world loses its substantiality and transforms into the moral state.

Sinergetics has a claim on the role of the science forming the methodology. The scientific conception of the world is getting to become “an energy”.

The ideology of a proceeding prevails. Putting in a claim for being a weltanschauung sinergetics undermines the foundations of the subject-object identity, transforming it from real into possible, from reality into the virtual reality. It means that per se a human loses his identity, turns into singularity, an individual unit. It is impersonal, but is not missed in “the abyss” of the objective reality. The singularity is the same thing that once had been a man, a subject, an individual, a personality, an existence.

Non-traditionality is declared to be a general feature of the postmodern situation in culture. The declaration is unequivocal, as it has never been typical for the Russian creative mentality. But the whole of XXc. art was turned to reconsideration of the grounds which were set up in the European culture by the classical antiquity and Renaissance. At that time many authors started to exploit the idea of “a breakthrough”, a total change of the paradigms. Thus, the art partially inclined to the field of a pure experiment, technical and design searching, that brought about the shocking art and the kitsch. But even during the periods of jumps and transitions the old values, having been created the centuries – old experience of humanity were only driven back to the background, but they have never left the eternal verities of culture.

The outstanding artists in the beginning of the century though broke traditions knew them and appreciated them. K. Malevich in his late works came back to the traditions at another turn of art and created a number of portraits with shining faces in the manner of Renaissance. All of them had been creating the novelty and fell in with “the largest” cultural context.

Nowadays there is a direct evidence of generalizing the aesthetic art history and cultural problems and their acquiring theoretical-methodological and world-view sense.

Aesthetics is defined in terms of essential “playing” characteristics of the art, but the artistic creativity is getting to become a theory. In their desire to explain the universal nature of a human they bring themselves up to the levels of explanation “to the ground”. The investigations of the art creativity “to-the-ground” as the condition for knowledge and art existence bring to the investigation of deconstructivism phenomenon.

With formalists and futurists the art and life are on tense terms with each other, as an artist is an active source of creativity. According to R.Barth, an author is “guest of his text”, one of many “visitors” of the text. Consequently, the theory and the creative ac-



tivity in the traditional sense are secondary and dependent on writing, the practice of which seems to be primary.

Interpreted in such a way “the writing” opposes any philosophical-aesthetic doctrine tending “to stop” the process of “the texts” creation with this or that monistic explanation. Theory doesn’t aware what “writing” must be. Any theory arises after “writing”. Thus, philosophizing cannot forego the art practice and cannot put guidelines for it.

That is the “writing” practice that is the aesthetic philosophizing, but the art acquires the functions of reality interpreting not through the heroes’ thoughts and talks but through “the writing” dynamics.

The ideas of a character or a story are absolutely old and useless from the “writing” theory point of view, but the author’s power is in breaking the stereotyped patterns, which had had been built before “writing”, and the power of aesthetics is in the mission to understand and interpret “the writing” rejecting the sphacelated stereotypes.

The idea of deconstruction being concerned, its negative sense is brought to the forefront, the skepticism. Speaking about nowadays culture we cannot explain the flowering of skepticism only with returning to the tradition, though the adherents of deconstruction keep saying about nonremovability of skepticism in the philosophical speculations, referring to the traditions ascending from the antique times.

On the whole in the deconstructivism we can clearly see the searching for other theoretical-methodological guidelines and other prospects for the scientifically interpreted humanism, it gives away longing for “the generality”, yearning for having back the established and traditional.

Summing up the written above we should admit that on the ground of the postmodernism philosophy the innovative art has been growing up as an empiric mental prac-

tice, being built on the basic principles of the innovative art-consciousness of the present: game, irony, ugliness. The innovations in the field of aesthetics are described with such notions as: deconstructivism, absurdity, cruelty, artifact, eclecticism, text, hypertext, flesh, daily routine, gesture and others. The same notions are simultaneously seen as the aesthetic forms of the transition period in the art and aesthetics of the present time.

From the standpoint of the classical aesthetics adherents the postmodernism art negates the values of the traditional culture and the image-symbolic nature of the art. But we contend that the innovative practice of the postmodernism doesn’t disclaim, but extends and intensifies the semantic area of the modern aesthetic consciousness.

That’s why we have come to the conclusion that the modern aesthetic theory should keep the systems of the main traditional values of culture not as some museum relicts but as the living and real forms of the modern art practice and culture.

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*Materials of a Conference***PUBLIC INFORMATION AND PUBLIC KNOWLEDGE**

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The necessity of revelation of correlation of public information and public knowledge is connected with the uncertainty in differentiation of concept "social information" and "knowledge". It is marked in "Philosophic Encyclopedic Dictionary" that "information" (lat. information – introduction, explanation) – is a concept used in philosophy from ancient times and thanks to cybernetics got a new wider meaning in recent times, where it is one of the centre categories along with the concepts of relation and administration... The original understanding of information as data was till the middle of XX century... The development of the concept information in contemporary science has led to appearance of different ideological, especially philosophical interpretations (transcendent, in other words supernatural kind of information in neotheism; information as subjective phenomenon in neopositivism and existentialism")[1]. So as understanding of information is different, there are different criteria of delimitation depending on what meaning is put into concept "information".

Believing that such situation is due to unexact use of informative approach, A.V. Sokolov marked several points of view on criteria of delimitation. "Another example of uncertainty, coming from incorrect use of informative approach, - A.V. Sokolov says, - may be an issue of delimitation of concepts "social information" and "knowledge", to which many social scientists applied". His suggested criteria of delimitation may be summed as followed:

1. Information is an objective bioenergy process that is happening in society, machine or a life form and knowledge is a subjective resultant of conscience, something ideal. In this case, a question of knowledge objectification, in other words its transformation into information, remains open, otherwise other people can't learn about ideal products, elaborated by subject's conscience; it is also unclear how a recipient turns "objective" information into subjective content of his conscience.

2. Information is knowledge in its communicative form, a way of knowledge delivery, moving knowledge. Here information is not a special, different from knowledge phenomenon, but designation of a certain condition of knowledge, like steam is an aggregative condition of water. Theoretically, strange to think, that knowledge itself is "not information", but it "turns into information" as soon as it's used.

3. Information is raw material to get knowledge, semi-product, and imitation of knowledge; in

turn, data is semi-product of information. Thus, concepts data – information- knowledge are logically relative as concepts grain – flour- bread. But these logical relations are not criteria of delimitation, as any knowledge may be information, and any data is knowledge – a result of human experience.

4. Semiotic handling of information is stated in two contrary, as it may seem, judgments: a) knowledge is information that got a new significant form; b) information is knowledge embodied in sign-oriented form. These judgments are compatible, as in first case cognitive process is meant and in the second – communicative process. But both they are not complete, as first keeps knowledge beyond sensual images, emotions, wishes that are not verbalized, and the second keeps information beyond the same.

So, there's no clarity. The reason of the failure is incorrect approach: firstly, knowledge has been disguised as information, and then the two concepts were tried to be distinguished. Only one conclusion can be made out of these points of view: social information is knowledge, more precisely- knowledge's pseudonyms as part of incorrect informative approach [2].

Stating these points of view, A.V.Sokolov doesn't give clear answer to a question about correspondence of concerned concepts, as he believes, that information is just "artificially created intellectual construct, creation of informative approach", moreover the informative approach is primary and information is secondary [2]. The essence of informative approach, with the help of which A.V.Sokolov explains existence of different criteria of delimitation of "social information" and "knowledge", is that category "information" is inducted as "knowledge's" pseudonym and the objects of study are considered through this category perspective.

But there's a question: why has figment "information" and not "knowledge" found such a widespread use. A.V.Sokolov explains it in the following way. The thing is that informative approach in its incorrect condition carries the following useful functions:

A. Normative function: initially the word "information" has been used to name really existing things, for instance, "Scientific and Technical Information Service", "information officer", "information equipment". In this case "information" appears not as scientific concept, but as a name of a subject of specific kind.

B. Constructive function: engineers who construct and use information equipment perceive information as "working body", like liquid in hydraulics or current in electrotechnics, they don't feel incorrectness of the perception (here signals and information are equal) and can't give it up.

C. Descriptive- explicative function is often realized in natural and social sciences. Moreover,

there's a peculiar explanation of "unknown by unknown". For example, we know nothing about how memory, understanding, thinking really work, but we can intelligibly discuss these difficult psychic phenomena by instinctively comprehending the concepts of information: memory is information storage; understanding is information coding; thinking is information adaptation. Communication among people and animal indication, administration and relation in technical equipment and biological systems are especially successfully depicted by means of informative models. Here potential of generalization is realized, that is always present in a concept of information. We may say that in descriptive- explicative schemes of specific sciences information is not "a removed uncertainty" as it appears in mathematical model of information, but "a constant uncertainty", general scientific mental aid, with the help of which the ascension from relative to absolute truth is performed [2].

A.V.Sokolov distinguishes correct and incorrect informative approaches. Informative approach is a methodological principle of scientific cognition, which includes consideration of objects of study through information category perspective. Two models of informative approach use are real: correct, when information models and reality are separated from each other, and incorrect, when information is identified with real objects (signals, knowledge, reflectance property. structure). Incorrect approach is widespread used in science and practice as it may fulfill useful functions: nominative, constructive, descriptive- explicative.

Public spread of correct and incorrect informative approaches is explained by quantitative growth of communicative channels and growth of significance of social communications in industrial neoculture. The formation of a cycle of information sciences, which include family of informatics, is due to the same reason.

We should also mark that if we take into consideration the way A.V.Sokolov understands "information" (figment, pseudonym, knowledge), then both approaches appear incorrect. And the thing is that not what informative approach is used- correct or incorrect, but what is understood by information and how it differs from knowledge.

To learn in what correlation concepts "public information" and "public knowledge" are, we should learn what they have in common and what the difference is. For this, we should remember logical laws. In accordance with logics concepts may differ or coincide by such characteristics as volume, contents and level of abstraction.

What can be detached in common? Knowledge, the same as information, appears on the ground of sensual and rational forms of reflection; the same as information, knowledge gives data. Both concepts fixate the results of reflection. The concepts are the same by the volume of fixated fragment of reality. Therefore, differences are real only at levels of abstraction.

As we've marked earlier, levels of abstraction are formed depending on what phenomena are fixated while concepts are formed. If concepts are formed by abstracting from objectively current things, then it is abstraction of first order. If the concept is formed from abstractive concepts of the first order, then it is abstraction of the second order. Abstraction of the second order can be formed from both abstraction from concepts of first order and from objectively current things, processes. Abstraction of the third order comes from formation of concepts from concepts of the second order and so on.

In logical form, knowledge is presented as specific summation of interdependent judgments about something or somebody. In public memory different knowledge is encoded in terms of gradually fixated judgments. The system of such judgments gives conceptual image, conceptual contents of concerned phenomena and happening to it changes. Concept "knowledge" corresponds to high level of abstraction from material and ideal reality, conceptual contents without human's respective relation to it is fixated in it.

Concept "information" relates to higher level of abstraction in comparison to concept "knowledge". "Information" appears as a result of abstraction from concepts "knowledge", "needs", "interests" of a human. Substantial content of "knowledge" is fixated in concept "information", considering human's relation to it. Concept "information" relates to a system of axiological concepts, judgments from the point of view of human's needs, interests and wants are fixated in it. That's why information is incentive. Reflecting the same reality fragment, concepts "information" and "knowledge" differ by the level of abstraction. On this basis, we may conclude that the same difference consists in concepts "public information" and "public knowledge".

Therefore, we come to the following conclusions:

1. Uncertainty in correlation of "social information" and "knowledge" is connected with that "information" is given different meaning and there's no analysis of the concepts within the limits of logical laws.
2. Correlation of "public information" and "public knowledge" gets certainty by taking into account logical rules of concept formation. These concepts have something in common and differ at the same time.
3. The following is in common. Public knowledge as well as public information appears on the ground of sensual and rational forms of reflection of reality. But differ by the levels of abstraction. Concept "public information" corresponds to a higher level of abstraction. Concept "public knowledge" corresponds to high level of abstraction from material and ideal reality, conceptual contents without human's respective relation to it is fixated in it. Concept "public information" comes as a result of abstraction from concepts

“public knowledge”, “need”, “interests” of a human and society. Concept “public information” relates to a system of axiological concepts, judgments from the point of view of needs and interests are fixated in it.

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*Materials of Conferences*

**NECESSITY OF DEVELOPMENT  
OF METHODS AND DEVICES OF INCREASE  
THE ACCURACY OF ANALOG-DIGITAL  
TRANSFORMATION PROCESS**

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Today digital processing of signals is impossible without preliminary analog-digital transformation. Analog-digital converters (ADC) provide direct communication and transfer of the measuring analog information from object of measurements in the computing or managing digital device. Thus, reliability of the information about meanings measuring of sizes, and, therefore, productivity of the decisions, accepted on their basis, or quality of management of processes, are defined by accuracy used ADC. From here follows the importance of study of the reasons influencing accuracy of transformation, and also realization of researches directed on increase to accuracy of transformation.

In practice for the decision of a task of increase the accuracy of process of analog-digital transformation, use only precision ADC, in perfection and which creation the modern firms - developers of electronic components are engaged. However, it completely does not decide the put task for several reasons. First, high accuracy of the characteristic ADC yet are not a guarantee that in conditions of influence external damage of the factors, at which equipment given ADC all also usually works will be exact. Secondly, the process of analog-digital transformation is complex and provides besides the basic operation of analog-digital transformation which is carried out ADC, also performance of a number of necessary accompanying operations substantially determining accuracy of transformation in whole. It is operations previous to analog-digital transformation: samples and storages of entrance signals ADC, formation of absolute meaning of entrance bipolar signals ADC; and subsequent operation of correction of errors ADC.

However, neither in the technical literature, nor among the developers, to these operations (subsystems) is not given of sufficient attention. This testifies to necessity of realization of additional researches for this area. Therefore on our sight, the task of increase of accuracy of process of analog-digital transformation should be reduced not only to perfection of integrated microcircuits which are carrying out transformation, but also to complex increase of accuracy of process of analog-digital transformation, in view of subsystems, included in him. We are engaged with development of methods and devices of their realization directed on increase to accuracy of operations of analog-digital transformation.

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**THE ANALYSIS AND SYNTHESIS OF  
OPTIMUM STRUCTURES OF ANALOG-  
DIGITAL AND DIGITAL-TO-ANALOG  
TRANSFORMATION OF SYSTEMS OF  
AUTOMATIC CONTROL**

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Modern discrete systems of automatic control (regulation) contains in the structure both digital (discrete). and analog (continuous) parts. For the coordination of these parts in system are used analog-digital (ADC) and digital-to-analog converters (DAC). Their metrology characteristic (first of all, accuracy) play the important role in maintenance of quality of realization measuring, managing functions of systems of automatic control and their serviceability.

Therefore our scientific research is directed on the analysis of the reasons. lowering accuracy of transformation, and development the possible ways of reduction of their influence. And then - on the decision optimum of a task and development of the recommendations on construction of effective structures of input-output of the information in systems of automatic control. With this purpose the following research problems were put:

1. Development the methods of increase the accuracy of a subsystem (process) of analog-digital transformation. The given task already is decided by development of ways of improvement of the characteristics of devices the sample and storage of entrance signals АЦП; development of a method of formation of absolute meaning(importance) of entrance bipolar signals ADC; perfection of methods of correction the errors ADC; theoretical and experimental researches of the offered technical decisions on perfection of process of analog-digital transformation.

2. Development the methods of increase the efficiency of a subsystem of formation the supporting voltage for ADC and DAC on the basis of development the methods of formation the supporting voltage and technical decisions precision, thermo-constant and not much noise the sources of a supporting voltage.

3. Development the methods of increase the accuracy of a subsystem (process) of digital-to-analog transformation.

4. Synthesis of optimum structures of input-output of the information in systems of automatic control on the basis of development the method of struc-



tural - parametrical synthesis of complex system and decision optimum of a task.

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### RESEARCH OF DETERIORATION AND PRODUCTIVITY OF A BAND SAW

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In the given work specific characteristics of deterioration of band saws are considered that allow to predict sawing up process and raise firmness of the tool and its productivity.

Deterioration of teeth of a band saw on a back surface was measured in process of experimental sawing up material in diameter by 160 mm, which was steel 45. We applied the band saw machine model C8523 Joint-Stock Company "special design bureau ALMS" As a tool was used bimetallic band saws of firm "Rongen" in height of 27 mm with variable step of teeth at length of 25,4 mm As applied 10 % of a solution emulsion.

The band saw has many teeth which of them cut only small part in time of cutting. Sawing up by a band saw is one of the most effective ways of cutting considering distribution of heat and effort of cutting.

Deterioration of teeth of a band saw is typical to the mechanism of deterioration of other cutting tools. And still deterioration occurs in unusual way. Teeth wear out in the localized zones - on a back of a tooth and on its lateral surfaces where the tooth contacts to a processed material. At definition of firmness intensity of deterioration of a band saw is the most convenient for defining at measurement of deterioration of teeth on a back surface. Deterioration can be divided into three zones: a zone extra earnings, an operating conditions and a zone of critical deterioration during which time it is necessary to replace a saw.

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### RATIONALIZATION OF SECONDARY POWER SUPPLY

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Single phase secondary power supply (SPS), thanks to small weight/torque ratio (kg/kW) and quick response time, has found widespread use in a range of

capability from tens W (home video) to several kW (electrical constant-voltage regulator, electric arc welding sets and so on).

One of the essential disadvantages of SPS is low power factor (PF). By using a power factor corrector of modified algorithm of operating it, which allows PF up to 0,95 and more [1], this issue can be considered solved. The following rationalization of SPS in terms of, for example weight/torque ratio decrease and wastage decrease has the following restrictions:

- because of asymmetry of output strain of a chopper power isolation transformer is fulfilled with an airspace in the core and is used only at a private loop, that makes ineffective two- cycle bridge scheme of a chopper in comparison to single- cycle, and eventually leads to transformer overall factors increase.

- increase of output strain frequency of a chopper allows to decrease size of a transformer and smoothing inductor. However, wastage in power transistor is increased. The last is especially essential for powerful SPS.

Including capacitors successively in a chain of power transistor primary coil allows excluding constant constituent in output strain of a chopper and in some cases decreases commutation wastage in power transistors.

Using semi-bridge transistor choppers with capacitors in a power chain for SPS provides two-cycle mode of transformers while there's no constant constituent in a stress curve. This allows using a core without airspace and with high extent of rectangularity of a loop. As a result transformer's size and wastage in it may be decreased (with the same frequency) in 2-4 times in comparison to schemes without capacitors. The advantage of this solution is also simplicity of a chopper power part (two-cycle mode is achieved only by two power transistors). Correspondingly, operating system is simplified.

A bridge scheme, as well as semi-bridge, allows two-cycle mode of a power transformer and its whole usage. There are twice more power transistors and output channels of chopper operating system in this scheme, but there's only one commutating capacitor.

The two considered SPS schemes with capacitors in power chain are identical by its external characteristics, however bridge scheme (except for low power SPS) is more preferable than semi-bridge.

Including capacitors into chain of primary coil of chopper power transformer gives an opportunity to use the core of the transformer without airspace and with little excitation current and with the use of the whole loop that allows essentially decreasing its size. Natural external characteristic of capacitor choppers has lineal part with rigidity determined by total resistance of SPS and a section with load constant power. The lineal part may be, for example, used for welding in carbon dioxide, and section with constant power is ideal for welding in the air. Moreover, capacitor's real

doubling of rectified voltage amplitude simplifies starting and arc stabilization. At a section with constant power current through chopper transistors is broken, that means transistor commutation is without current, wastage is minimal, and that allows increasing frequency and decreasing SPS sizes. Technologically necessary quantity of steps of power may be achieved by two-three capacitors of different volume with a step switch without any close ADS. Not operating chopper- a chopper without PWM or any other way of strain regulation allows solving a problem of galvanic separation of chopper power transistors with the help of a tiny isolation transformer at self-excited oscillator output. There's no need in expensive power units with composite transistors and optoelectronic isolation [2]. Defense from through currents in "non-operating" choppers may be achieved by small-size triple wound choke [3] and current limitation by the diode-thyristor block action upon the operating system.

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#### NEW SYSTEM OF SEMI-BRIDGE TRANSISTOR CHOPPER OPERATING

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Transistor choppers, both single and two cycle, have found a use in different secondary power supply sources [1]. Transistor chopper operating systems are devised on typical microcontroller level [2]. This system is used to operate any two cycle chopper and may differ only by the quantity of output channels (for one bridge- four channels, for semi-bridge- two channels). The operating system generates impulse signals at operating inputs of chopper's transistors, on-off time of which determines the duration of transistor's on-mode. In semi-bridge chopper the necessary transistors' on-mode duration decreases by the stress growth. That means the necessary transistors' on-mode duration may be much less than the duration of gating impulses from the operating system's output. That leads to outrageous wastage in transistors.

The suggested operating system of semi-bridge transistor chopper [3] is shown at fig.1 and consists of semi-bridge transistor chopper 1, operating system 2, and automatic regulator 3. The chopper includes two capacitors 4 and 5, successively connected, two transistors 6 and 7, also successively connected, and two bypass diodes 8 and 9, shunting in backward direction transistors 6 and 7. Vertex of capacitors 4 and 5 and transistors 6 and 7 make an alternate current diagonal, which includes load 10.

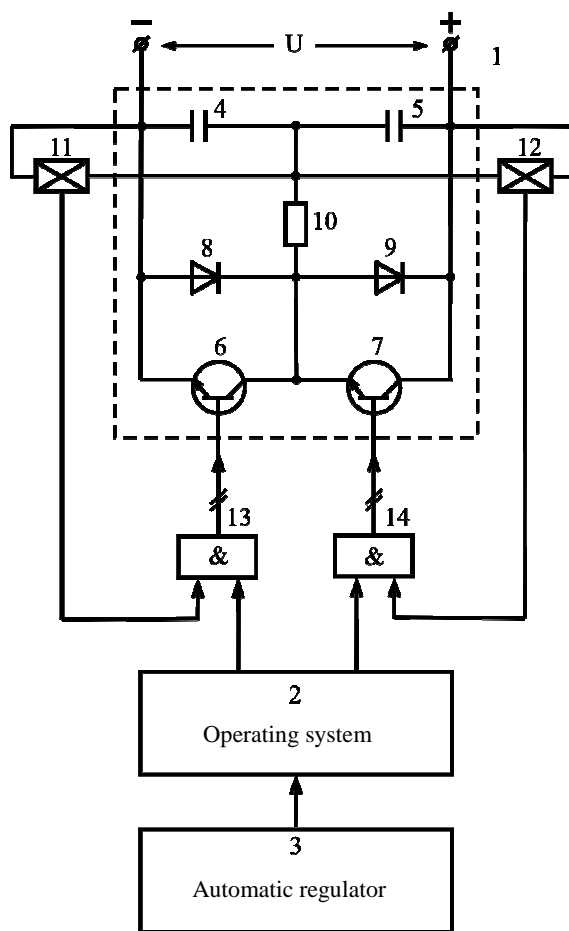


Figure 1

Capacitors' 4 and 5 and transistor's 6, 7 exposed ends are combined and respectively connected to direct-current voltage source.

Thus, block 1 represents semi-bridge transistor chopper identical to known prototypes.

Block 2 contains typical operating system of semi-bridge transistor chopper, built on the principle of pulse-width modulation which has two outputs (by the chopper's transistors). Detailed scheme of block 2 is presented in [1]. Automatic regulator 3 is connected to input of block 2, which is also a typical unit, usually presented as analog comparator. Additional elements of scheme pic.1 are two voltage sensors 11 and 12 and two logical two-input elements "I" 13 and 14. Voltage sensors 11 is turned on by input in parallel with capacitor 4, and voltage sensors 12 is turned on by input in parallel with capacitor 11.

Sensor's 11 output is connected to one of the inputs of logical two-input element "I" 13, and voltage sensor's 12 output is connected to one of the inputs of logical two-input element 14. Exposed inputs of logical two-input element "I" 13 and 14 are connected with respective outputs of operating system 2, and outputs of logical two-input element "I" 13 and 14 are connected with respective inputs of transistors 6 and 7. To simplify, buffer circuit of galvanic separation

and formation of signals from the detector element are not shown at pic.1.

As soon as strain at the capacitor, for example 4, reaches 0, "unit" disappears at output of logical two-input element "I" 13, transistor 6 will close, and accumulated electromagnetic power in load 10 will discharge circuitally: load 10 – diode 9 – capacitor 5 – load 10. Besides, the discharge current will go through energy supply's output capacity.

Wastage in transistor 6 at this interval is excluded, and accumulated electromagnetic power in the load partially goes to capacitor 5, partially returns to energy supply. Apparently, the efficiency of the suggested mechanism is higher, when load current is more, for example, while using a chopper for power supply through an electric arc's reducing transformer in a welding set.

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#### IDENTIFICATION AND FALSIFICATION FORMULARY OF STRUCTURE MEAT PRODUCTS BY MEANS OF THE PCR- ANALYSIS

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The problem of healthy nutrition of the population has the important social and economic importance. Background production of food products from animal raw materials is determined by the strategy to encourage a healthy lifestyle and nutrition of the population in accordance with the concept of public policy in this area.

The priority is the establishment of meat processing industry resource saving technologies of safe meat products of new generation with high nutritional and biological value for the different social and age groups, the relevant requirements of the Federal Law «On the Quality and food safety».

Important steps in addressing the problem of obtaining safe products of assured quality is the development, exploration and development of systems of integral control of food commodities and food products using highly effective methods of analysis. At the stage of development and introduction of GMOs are products with enhanced nutritional value,

have a long shelf life, improved organoleptic, lack of allergens and other properties. Considering the use of genetic engineering in the production of meat products as very promising direction should take into account the potential for inadvertent or deliberate creation of products from GMOs may have negative effects on the human body in an uncontrolled genetic engineering. This causes the need for multilevel control of meat products with genetically-modified analogues, including the State Sanitary and industrial control with mandatory implementation of laboratory research.

In addition, based on international practice for the control of products for compliance with scientifically based formulations and determination of the commodity composition of finished meat products for compliance with the requirements of regulatory documents are often marked to comply with these requirements. However, not always and not in full can be detected in the finished meat products various not meat components, such as soy additives, starch, carrageenan, gums. Chemical methods do not provide adequate information, time-consuming and often expensive. At the same time, market conditions dictate the trend to use rapid methods for the study, among which should be allocated GOST R 52723 - 2007 «Products for food and animal feed. Rapid method of determining the commodity composition of food products by polymerase chain reaction (PCR)». The method has high sensitivity and specificity, the lack of contamination of PCR product (analysis is in a closed test tube, there is no stage of electrophoresis), significant savings of laboratory space and a shorter duration of analysis. Specificity is defined nucleotide sequence of primers, which excludes the possibility of obtaining false results. The peculiarity of this method is the determination of PCR products directly in the course of the reaction.

In connection with the foregoing, on the basis of an accredited Innovation Research Center, Orel State Agrarian University (accreditation certificate number ROSS.RU.0001.21PTS26) conducted monitoring studies of meat products for the maintenance of GMOs and carried out the identification of raw meat. The objects of investigation were more than 50 samples of meat products manufactured according to GOST and sold in the markets of the Oryol region.

Quantitative analysis of presence / absence of recombinant DNA viewer 35S in the test samples is shown that the species-specific gene found in quantities no greater than established by the Resolution of the Chief Sanitary Doctor of Russia № 42 from 25.06.2007, the Analysis of mitochondrial DNA genome of ruminant animals and the mitochondrial genome of pigs and poultry in the test material by polymerase chain reaction (PCR), in the form EPh - with electrophoretic detection of amplification products in agarose gel showed that in the first test sample contained tissue of chickens and pigs, whereas on the packaging as the ingredients are declared pork and

beef, while the second sample - the tissues of ruminant animals, chickens and pigs were found.

Thus, the study found evidence of fraud, when in meat products contain ingredients that are both prescription components are not declared in the relevant documents. This applies equally to both domestic and imported products, and requires strengthening Gos-

sanepidnadzor for products, including those containing GMOs and its labeling.

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*Short Report***THE DEVELOPMENT OF THE GERMAN SUFFRAGE (1815 – 1918)**

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The main trend in the German suffrage development both in the period studied and at present time is granting the elective rights to more citizens and democratization of suffrage. The slogan “Mehr Demokratie beim Wählen” (More democratic elections) has been successfully realized over XIX-XXI centuries.

Right after the collapse of the Holy Roman Empire the suffrage development process activated and separate German states got granting their citizens the rights to elect local representative government bodies.

Due to the Union Act of 8 June 1815 that stipulated adoption of class-representative constitutions providing for representative government bodies in some German states, gradually (first in the South-German lands) suffrage was implemented. It was rather limited: not universal, not equal, in most cases not direct and in most cases by secret ballot. Practically everywhere the right to vote personally was given to men only. Though in some German lands suffrage (the right to vote through a representative) was granted also to women. On the eve of the revolution of 1848 the portion of people granted suffrage in the German states varied from 0.5 to 17 percent (depending on the character of a state or district). But, despite all this, the suffrage in many German states was fairly democratic if compared with other European countries.

The development of suffrage in Prussia can provide us with a general notion of the German elections on every level in 1815-1918. Elections of local government bodies, of provincial bodies and elections of the united landtags in the first half of the XIX century cannot be described as free or fair, although they were elections by secret ballot, because nearly 90 percent of population had not the right to vote (on the religious and national grounds as well). Also it should be noted that the elective representative bodies in Prussia and in other German states did not play any important role as it were the monarchs who really had power and authority. It was not until 1848 when in Prussia people's representations were formed on the basis of rather democratic (though not direct) elections.

The Prussian pattern of the suffrage development was like this. First they intended to calm the population by granting the rights to form the representative local government bodies, but it proved insufficient. Then these rights were extended to the regional representative bodies, but it proved insufficient either. Later the united landtags of the German states were set but the citizens still demanded the people's representation and the monarchs gave in again. Eventually as revolts occurred, the idea of elective all-German peo-

ple's representative organ was realized. The population of most German states in 1848 was granted temporarily rather large elective rights to elect representative government bodies of every level.

As early as in 1849 three-class suffrage was implemented to elect the Prussian landtag. According to the suffrage the minority (those who belonged to the first and second classes) selected quite a few times more electors than the majority of voters (those who belonged to the third class). This suffrage determined the membership of the landtag. It consisted mostly of deputies who defended the interests of the well-to-do citizens.

The Prussian suffrage evolved against a background of the revolutionary movement in the following way: no democratic elections – the revolution of 1848 – implementation of comparatively universal, equal suffrage – decline in the revolutionary movement – three-class undemocratic suffrage – the revolution of 1918 – universal equal suffrage.

Because of considerable faults in limited class suffrage in Prussia the people were not very active in elections. Under the three-class suffrage it were the third-class voters who above all ignored elections because they saw that they could not affect the situation. The limited suffrage met the interests mostly of the wealthiest citizens thus the wishes of the far greater part of the population – the poorer citizens – were considerably ignored.

Yet, despite its undemocratic character the Prussian three-class suffrage did allow the greater part of men to express their opinion in elections. We analyzed the statistics and established that in Prussia the portion of the citizens having the elective rights was about 30 percent larger than in England at the same period of time.

The Prussian three-class suffrage was almost universal (granted to the greater part of the men's population), indirect, unequal; elections were held by open voting (the right for the secret vote went through a number of curious transformations: secret vote by ballot – secret vote by voting paper – open vote).

According to the legislation on the election of the first All-German National Assembly in 1848 citizens of some German Union states were granted the universal (for men), equal, direct suffrage by secret vote, while in other states the citizens (men only) were content with the relatively universal (there were some qualification requirements about financial independence or tax qualification), equal, indirect suffrage by open vote. Despite the relatively democratic suffrage in the German states only about 70 percent of voters took part in the election of the Frankfurt National Assembly.

On 12 April 1849 a law was passed “On election of the People's Chamber of Germany”. This law contained almost every principle of democratic suf-



frage. Men were granted relatively universal, equal, direct suffrage by secret vote. However the law never entered into force.

This law which came to be a sample of democratic suffrage for many countries for many years can be defined as one of the most outstanding events in the world's development of the law science and democracy.

It is traditionally believed that the election of the North-German Union Reichstag and then the election of the German Empire Reichstag were held on the basis of the universal, equal, direct, men suffrage by secret vote. But actually the suffrage was limited, unequal from 1871, elections were held by secret vote as late as from 1903.

Most faults of the Empire suffrage and of the legal status of the elector were eliminated with the passage of the law "On the Reichstag membership and proportional elections in large constituencies" on 24 August 1918. This law substituted the mixed election system for the majority one.

It is significant that the legal principle of equality of electors was broken in many elections in the German states because of the inequality of constituencies or because in case of equality of votes the winner was determined by lot. The inequality of constituencies stemmed from the fact that some of them were formed on the basis of the standard norm of representation while the others were based on the regulation that every area of the German Empire must have at least one representative in the Reichstag. We believe that this inequality of constituencies was justified even from the point of view of the modern legal norms.

The German states suffrage in 1815-1918 allowed the people only to participate in forming the representative bodies which were not important. Besides, the suffrage acted against a background of almost total absence of the political rights of the citizens during all the period studied (except the election for

the Frankfurt National Assembly); this is further evidence that the German suffrage was not free and fair. These were the main reasons why some people's demands were satisfied and the government devised more democratic suffrage in the German states than in other countries (in most German states the suffrage was democratized).

Social and political character of suffrage and elections based on it cannot be determined only by the procedure of elections and the elective rights stated in the legislation. It is political regime that is crucial.

In the early XIX – the early XX centuries the development of the suffrage in the German states was closely connected with the people's revolutionary demands. As these demands grew more insistent the suffrage grew more democratic. As the revolutionary movement slowed down the suffrage got limited. This happened because of fear that democratic suffrage may damage the essence of the state power. Deprivation women of the elective rights was considered natural and had not to be legally laid down. In most cases when granting citizens the elective rights the most important consideration was that people who have no economic influence must not participate in governing the state.

In our opinion the suffrage is an institution which can be constantly perfected but which can never achieve the ideal. For instance, in today's Germany which is a country with democratic suffrage many citizens still campaign for democratization of the suffrage as it was in XIX – the early XX centuries ("Suffrage not for everyone" [Wahlrecht nicht für alle]; "More democracy" [Mehr Demokratie]; "More democratic elections" [Mehr Demokratie beim Wählen]. These slogans today are as urgent as they were in the past and will surely be such in the future (The slogans of the initiative group which has been running a campaign for more democratic elections. URL: <http://www.neues-wahlrecht.de/vi-nrw-mitglied.html>).

*Materials of a Conference***SOUTHERN RUSSIA READINGS ON MUSICAL CONTENT**

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For the latest decades in the “Tree” of the home musicology there has been intensively growing a branch called “musical content”. It is an actual scientific trend examining the artistic image-bearing side of music. This trend, having such ponderable achievements as the works of B.L. Yavorsky, A.F. Losev and B.V. Asafyev, later by M.G. Aranovsky, Ya.S. Druskin, L.A. Mazel, V.V. Medushevsky, Ye.V. Nazaykinsky, A.N. Sokhor, Yu.N. Tyulin and a number of some foreign investigators has been actually supported and moved forward with the efforts of a great number of both competent and young scientists.

Nowadays the problems of musical content attract a lot of investigators. Yet, it is likely that the trend is being most developed in three scientific schools, really existing in Moscow, Ufa (in the “Laboratory of musical semantics”) and in Astrakhan – Volgograd. The illustration of this fact is that to the works of the musicologists leading the schools, namely: V.N. Kholopova, L.N. Shaimukhametova and L.P. Kazantseva there join the new publications of their followers. Four conferences devoted to the image-bearing principles in music: “Musical content: science and pedagogy” (Moscow, 2000; Astrakhan, 2002; Ufa, 2004) and “Musical content: modern scientific interpretation” (Rostov-on-Don, 2006) held in the latest decade, attracted a lot of scientists, holding identical ideas and gave corroboration of the great interest in these problems.

Besides this, in Astrakhan (2007) and later in Volgograd (2008, 2009) the Scientific Readings on the problems of musical content have become regular and traditional. The scientists, representing the higher musical institutions of the cities mentioned and also the investigators from Krasnodar, Maikop and other regions participated in them. At these Readings the participants promulgate their new ideas on the subject.

Late in August, 2009, at the Third Readings, those present got acquainted with the new scientific investigations made by L.P. Kazantseva, Doctor of Arts, professor (“Undercurrent senses in the music”); S.B. Kozhayeva, Candidate of Arts, Lecturer (“Semantics of the areas in Short Masses by I.S. Bach”); O.V. Shevchenko, Candidate of Arts, Lecturer (“The concept of the “Rider-New Comer” in the romantic ballad of “Horror”); D.A. Rakhimova (“Synthesis of the National and the International as a specificity of orientalism of S.V. Rachmaninov”); O.I. Lukonina, Candidate of Arts, Lecturer (“Pithy motives in the creative work of M.O. Steinberg in the context of Soviet Arts”). This time there were also displayed some genre problems in the talks of I.I. Vasiruk, Candidate of Arts (“The fugue in contemporary painting: the

problem of reflecting form and genre”); O.V. Shepsheleva, Candidate of Arts (“Choral solfeggios: on the problem of genre”); O.V. Shmakova, Candidate of Arts, Lecturer (“To the question of genre typology of a foreign neo-classical symphony”). T.S. Andrushchak, Candidate of Arts, (“Requiem” by B. Tishchenko – A. Akhmatova as a memorial text”) and I.V. Savina (“Mazepa” by F. Liszt as a reflection of the composer’s creative process”) “lended an attentive ear” to a musical composition, taken separately. The talks mentioned are published in the “Musical content: ways of research” collection (The collector-editor L.P. Kazantseva, Krasnodar, OOO Publishing House HORS, 2009, 156 p.).

At a first glance our Readings are reminiscent of conferences, habitual for any scientists. Though, yet they are aimed not so much at the messages of information, as at their discussion. Questions, commentaries, reflections, advice, prompts – all these for what far from always there isn’t enough time at a regular conference – interlace now and then a rather lasting, but always a constructive discussion which turns out to be a general “genre” of these Readings. All those present at the Readings particularly value the positive atmosphere of sincere interest, reigning at the Readings and inter-personal contents, so rare nowadays and therefore so extraordinarily highly appreciated ones.

The latter is no wonder, as the Readings attract people of the creative initiative, who are constantly in the process of scientific research and who crave to share not only their boons but also their doubts, guesses, hypotheses with the persons, holding the same views. To a certain degree thanks to such a “scientific laboratory” the constant participants of the Readings successfully work at their dissertational projects, maintain their theses (T.S. Andrushchak, M.V. Salnikova, O.V. Shepsheleva, O.V. Shmakova, I.I. Vasiruk – 2008) and their theses for a Doctor’s degree (P.S. Volkova – 2009). They publish their monographs [1] and articles, take part in scientific conferences on various problems. On 2009 the author’s collective of the Readings became a main body of the scientific school, officially registered under the title of the “Musical content” and its leader, the Doctor of Arts, professor, Academician of International Informationization Academy, correspondent-member of Russian Academy of Natural Sciences, Honoured Science and Education Worker L.P. Kazantseva has been awarded with the honorary title of a “Founder of Scientific School”.

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## Short Report

**THE CALENDAR VOCABULARY AS A STUDY  
SOURCE OF ANCIENT CULTURAL -  
LINGUISTIC CONTACTS OF SIBERIAN  
INDIGENOUS PEOPLES (TO THE PROBLEM  
OF THE ORIGIN OF THE WORDS “SPRING”,  
“WINTER” IN THE SELKUP AND THE KET  
LANGUAGES)**

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Different ethnic groups had been living, moving, assimilating on the territory of Western Siberia for a long time. Economic and cultural contacts between representatives of these groups had been arising during many years. The relations and the two-way influence of two peoples – the Samoyeds and Yenisseys (ancestors of modern Selkups and Kets) - is one example of such contacts. Samoyed-yenissey lexical equivalents demonstrated by some researchers may be given as the results of their relationship [1]. The correspondence between some words there is in languages of the modern Selkups and Kets too. The words “spring”, “winter” belong to such words. There are some different opinions about the origin of these words in the Selkup and Ket languages. Therefore it is reasonable to analyse peculiarities of the forming of the names for conceptions “spring”, “winter” in these languages.

1) Spring

The Selkup people used the word *Ytid* (*ödeD* and other phonetic variants), the Ket people used the word *yed'* for the conception “spring”. The famous Hungarian researcher Haidu P. supposed, that the selkup word has been borrowed from the Yenissey languages: nen. *djotti*, selk. *ödeD* < ket. *Yed* (spring) [2].

The prominent researcher of the Yenissey languages Joki A. expressed the same opinion, that the samoyed words with the meaning “spring” has been borrowed from the Yenissey languages, there are the following correspondence at that: selk. *ödäD* - ket – *yed'*, *yedi* - tib. – *dpyid* [2].

The well known researcher K. Bouda has the opposite view on the borrowing direction, namely: yen. *yed(i)*; kott. *iji* - spring < sam. *yid* [3].

2) Winter

The words with the meaning “winter” were fixed in the Samoyed and the Yenissey languages. There is the supposition, that the selkup *kä*, *ke*, *kam*, *khä* had been borrowed from Yenissey. From the E. Levi's point of view there are the equivalents: ket. *kete*, kott. *kēti*, tib. *dgun* [2]. Some researchers express the contrary idea: the yenissey root had been borrowed from the Samoyed language [4, 5].

Thus, contradictory linguistic data concerning the borrowing processes of words “spring”, “winter” in the Samoyed and the Yenissey languages have been demonstrated above. Concerning some opinions about relations of the Samoyeds and Yenisseys it may be

supposed the following peculiarities of the origin of the names for conceptions “spring”, “winter” in the Samoyed (Selkup) and the Yenissey (Ket) languages:

1) The words “winter”, “spring” had been borrowed by native speakers from each other during the period of the existence of Samoyed and Yenissey linguistic communities.

2) The words “winter”, “spring” had been borrowed by native speakers from each other after the disintegration of indicated linguistic communities (or one of them).

3) The words “winter”, “spring” have been borrowed by native speakers not from each other, but from another source.

It is known that there are many words in Selkup and Ket borrowed from other, unrelated languages. For example, words from Russian and Turkic have been fixed in the Selkup language. A whole number of common words of Ket and Chinese have been revealed as well [3]. The hypothesis about the connection of the Yenissey and the Tibetan-Chinese languages, based on the study of similar words, has been supported by many authors [6]. The famous researcher of aboriginal Siberian languages A.P. Dulzon has noted the correspondence between the words of the Ket and the Hun languages in addition [7].

The observed lexical equivalence and correspondences are the basis for the supposition about the available contacts between native speakers of above stated languages. There is the opinion about the connection between the Kets and the Chinese, the Kets and the Huns, (in addition between the Kets and American Indians too), etc. [7]

From the other side there is the supposition that the Samoyed and the Yenissey had the common ancient ancestral home situated in the south Siberia [8]. There is the idea about the single ancient cultural-linguistic community of Selkups and Kets [6].

It is possible to think about possible ancient contacts not only between the Yenissey (Kets) and Tibetans, Chinese, Huns, but between the Samoyeds and these three peoples. Therefore the words “winter”, “spring” in Samoyed (and in Yenissey) could be borrowed from languages of Tibetans, Chinese, Huns.

4) The above mentioned words “winter”, “spring” are unrelated.

There is the assumption that the Samoyed word roots with the meaning “winter” (selk. *kə*, *kamas*. *khä*) have nothing to do with the yenissey root \**gəte* – “winter” [4].

So, the research of the calendar names with the meaning “winter”, “spring” in Samoyed (Selkup) and Yenissey (Ket) are connected with some different and sometimes conflicting conclusions.

Thus, it is impossible to identify the true origin of calendar names in above mentioned pre-literate languages on the basis of only linguistic data. The form-

ing of words with the meaning “winter”, “spring” can be found out by means of the integrated approach. This approach consists in the synthesis of many different techniques and data, concerning: linguistic, ethnographical, historical, philosophical etc. This approach covers both the Samoyed (Selkup) and the Yenisey (Ket) (and other peoples). It means the detailed study of the vocabulary, semantic, phonetic, borrowing and other processes in languages of these peoples, the comparative research of their social and economical structure, of the material culture traits, of the thinking type, of the territorial and climate life peculiarities, the investigation of the ancient relations between the pre-literate Siberian peoples and the analysis of many other facts. This method will permit to understand the true origin of indicated words. So, the research of calendar names in the Selkup and the Ket languages causes the general study of many-sided ancient cultural - linguistic contacts of many Siberian indigenous peoples.

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#### Abbreviations

- yen. – Yenisey  
kam. – Kamass  
kot. - Kot  
nen. - Nenets  
sam. - Samoyed  
selk. - Selkup  
tib. - Tibetan



*Materials of a Conference***THE PSYCHOLOGICAL PROBLEMS CAUSED BY CONSTITUTIONAL-TYOLOGICAL INSUFFICIENCY OF THE HIGHER NERVOUS ACTIVITY AND THE PERSONALITY**

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It is obvious, that taking into account temperament type in diagnostics and correction of various disorders is necessary. There are concepts of temperament giving the estimation of interrelation of its nature and psychosomatic condition of the person. So, E. Krechmer (1930) considered temperament as, the factor fatally predetermining occurrence of one or another form of pathology. By H.J. Eysencks data (1967) in considerable strengthening of neurotizm combined with pronounced introversion develops dysthymia with obtrusiveness, fears, in the combination with extroversion develops psychopathy and a hysteria. I.P. Paul considered that choleric persons are inclined to neurasthenia, and melancholiacs are inclined to hysteria.

There are the works of the Russian researchers describes the study of features of temperamental characteristics in persons with different chronic somatic diseases (E.J. Petrosjan, J.I. Savchenkov 1995, 1996). It was found that chronic somatic diseases etiological various in a stage of remission appropriately leave traces on temperamental characteristics at young men and girls (age of 18-20 years). And character of this influence has determined by sexual differentiation and depends on nosology so for example, characteristics of girl's temperament in the presence of chronic somatic diseases in a stage of remission turns out more stable, than young men's temperamental characteristics.

Authors concludes that the temperament does not determine an appearance of this or that disease, namely illness causes such changes of characteristics of temperament at which their general combination is stacked in frameworks of new style of the behavior which is distinct from what was inherent the person before occurrence of illness.

From foreign works the research of temperament and surroundings in formation of behavior disorders by S. Chess and A. Thomas retains attention. Authors have found out, that the connection between temperament and development of behavioral disorders is especially appreciable in children whose disorders were noticed at early age. In this period disorders first of all are caused by organic changes, not by surroundings which influence will have an effect later and will amplify with age.

In research of features of temperament of children and teenagers, healthy and with residual-organic mental disorders, G.A. Makarova had inspected 788 children, 688 healthy children (391 boys and 297 girls) and 100 diseased children (50 girls and 50 boys) in the age from 6 months to 16 years. The typology of

temperament is put in a basis of studying of temperament of A. Tomas and diagnostic clusters presented in works of W. Fullard, S.C.Mc. Devit and W.B. Carey (1987). Findings about distribution of types of temperament among healthy children are compared with two researches, conducted in the USA and with one research in Russia.

An American sample included 309 children in the age from one year to four years (W. Fullard, S.C. McDevitt, 1987) and 187 children in the age from 8 to 12 years (Hegvik R. 1982). In the American population of healthy children there were more children with type of temperament "the easy child" (37,9%) and less with type "the difficult child" (12,3%) and "slowly warming up" (6,2%). In E. Slobodskaya's work (1995) there were inspected 89 healthy children in the age from half-year to two years from full-grown families (84%), visiting a day nursery. In the investigated population there were more children with type of temperament "the difficult child" (17,3%) and "slowly warmed up" (11,5%). Type of temperament "the easy child" made 25,2% and met rarer, than in our and American groups of the surveyed children. Type of temperament "the easy child" made 25,2% and spreaded less often, than in our and American groups of surveyed children. Types of temperament "middling high" and "middling low" made in the sum of 43-46% in all three researches. In R. Hegvik's work (1982) distribution of types of temperament among healthy children at age from 8 to 12 years, essentially did not differ from ours, fluctuations made 1-2%.

Summarizing it is possible to assume, that the typology of properties of temperament by A. Tomas (A. Thomas, Chess S. 1994-1996) who uses six diagnostic cluster-types of temperament at children, allows to describe variants of temperament, both healthy children, and children suffering mental infringements. It is an indirect attribute of organic lesion of a brain if the deviation from mean-aged norm in children in the age from half a year to 12 years more than on +0 for two and more of the following parameters of properties of temperament: "activity", "adaptability", "approaching", "intensity", "mood", "rhythmicity". It may be the ground for consultation of the child with the medical psychologist or the children's psychiatrist.

Among Russian researches our attention has drawn the work written by E.R. Slobodskaya (2000) "Temperament as the factor of adaptation of the person in the critical periods of development". She allocates three levels of individuality: an organism, the individual, the personality. The subject of scientific research on a level of the individual was the temperament. In the early childhood behavioral manifestations of temperament are associated with regulation mechanisms of a cardiac rhythm. Numerous interferences between social factors and temperament are indicating about surrounding's influences on temperament, and

about the selecting and forming a surroundings by temperament. The singular children are more active and more easy get used to changes, in new educational conditions the mood is lastingly worsened. Children with a heightened interest to the new have rather young fathers, both of their parents aspire to receive education, and the family lives in a hostel, while children with avoidance of the new often live in big families – three-generational, with several children. An absence of intersexual distinctions, typical for others cultures, in temperament of the Russian teenagers can explain social-psychological mechanisms of formation of a sexual role.

An absence of relations between the temperament and a disease in the early childhood is explained by equal adaptive possibilities of the constitutional types. The orderliness is positively influences progress for teenagers; high activity, intensity and approach are promoting the behavioral deviations, and sensitivity – causes an emotional disorders. So, there is a persistent interference of external and internal factors and of the intermediate results taking place during the individual development.

The researches of I.V. Boev, O.A. Ahverdova, and N.N. Voloskova are pointing to residual-organic insufficiency of the central nervous system as "ground" which causes dysontogenesis of the age development.

N.N. Voloskova (2001) shows that prenatal, natal and early postnatal exogenous influences are promoting the formation of the constitutional-typological insufficiency of the higher nervous activ-

ity and/or the personality. At the point of the view of O.A. Ahverdova (1998) and I.V. Boev (1999), the etiopathogenetic mechanisms causes an abnormal personal variability, may be various exogenous influences. I.V. Boev (1999) has allocated a constitutional-typological personality continuum, where the boundary abnormal person occupies an intermediate position between psychological norm - the character accentuation and the pathological mental constitution - the psychopathy.

N.N. Voloskova (1996-2000) develops and proves the theoretical proposition about the formation of an exogenous-organic origin abnormal personality variability caused by prenatal, natal and early postnatal destructive consequences of the exogenous influences.

So, constitutional-typological insufficiency of the higher nervous activity and/or the personality causes children's behavioral changes in the form of a lowering of adaptive ability, of an occurrence of uneasiness, an excessive obstinacy, high distractibility, of increasing or lowering of activity. These displays may be accompanied by vegetative symptomatology; the favorable social conditions can lower changes in the child's behavior, and the adverse social conditions - to strengthen.

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*Materials of a Conference***POSSIBILITY OF PROCESSING OF TUVA MINERAL DEPOSITS BY BIOTECHNOLOGY**

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Nowadays in the scientific world biotechnology develops more and more. There is no uniform exact definition of the concept "Biotechnology" among scientists. The biotechnology is told to study methods of reception of substances useful to the humanity and products in operated conditions, using microorganisms, cages of animals and plants or isolated biology structures from cages. Biotechnology is the concept used more wider.

Biotechnology irrupts into the metallurgy and mining industry, an oil recovery, at the same time the new branch – "biogeotechnology" develops.

There is a set of bacteria, microorganisms opening which precious metals promoting extraction.

*Raw-material base of Tyva Republic*

The Republic of Tyva has the unique unmastered natural-resource potential. Deposits of coal, ferrous, nonferrous, precious and rare metals, nonmetalliferous raw materials, underground drinking and mineral waters are revealed. More than 20 mineral resources are explored.

The mountain-metallurgical complex is provided by industrial reserves of the complex silver-gold-copper-nickel-cobalt arsenide ores.

The resource potential of a fuel-energy complex is presented by large reserves of coked and power coals.

More than 20 deposits of various building materials are explored in total.

Wood (the general reserves are about 1075,9 million cubic meters).

In our republic basically alluvial gold is extracted. The organizations, the factories extracting gold on the territory of Tyva Republic are the Society with limited liability "Vostok", the Society with limited liability "Tyva geology-prospecting expedition", Gold mining company "Oina", gold mining company "Tyva", the Society with limited liability "Tardan Gold".

Extraction of ores and reception from them nonferrous metals, especially precious, particularly gold and silver prices rise all over the world. Principal causes of such tendency are following:

- the reduction of ore reserves of nonferrous and precious metals, growth of expenses at extraction and manufacture of these metals;
- the expansion of national and international efforts on stabilization and on the control of the prices for raw material sources;
- the necessity of managing by own raw material sources, especially by strategic raw materials;

- the performance of the international and state requirements on preservation of the environment in communication, according to it the removal and burying of wastes become more and more difficult;

- fast increase on the prices at raw materials and energy sources that causes the recycle of the fulfilled products and the equipment more effective, than utilization of primary raw materials.

After ore processing by gold mining companies, tailings of concentration and slags quite rich in content of gold remain in tailing ponds.

For example: the alluvial deposit of the river Black is a part of the Amyl-Sistigkhem auriferous region, which is located in the north of Tyva Republic and in the south of Krasnoyarsk region. This deposit is processing by the gold mining company "Oina"

After enrichment on the vibrating concentrator (VCK) for one cycle in tailing pond № 1 gets tails with the maintenance of gold of 6,5 mg/m<sup>3</sup>, and after operational development in tailing pond № 2 gets tails with the maintenance of gold of 2400 mg/m<sup>3</sup>. Slag, with the maintenance of 4500 mg/m<sup>3</sup> from fusion of a concentrate of operational development gets into the tailing pond № 2.

For all period of operation of a deposit on the river Black the large quantity of a waste with the sufficient maintenance of gold, for bacterial lixiviation has collected.

Expediently it's better to lixivate by bacteria (thionic bacteria Thiobacillus ferrooxidans, Bacillus, Bacterium, Chromobacterium) gold with the low maintenance in tubs or to apply compact lixiviation, as it is used in some gold-extraction industrial complexes of Russia and Abroad. (In Olimpiadinsk deposit "the Gold Pole" and a Suzdal deposit in Kazakhstan ("Severstal" is the Northern auriferous company)).

As a result of processing cobalt arsenic-bearing ores at the industrial complex "Tyvacobalt" were formed slime products which have carbonate-silicate composition with the mass maintenance (in recalculation on oxides); SiO<sub>2</sub> - ~30-40 %, CaO - ~18 %, Al<sub>2</sub>O<sub>3</sub> - ~8 %, MgO - ~8 %, Fe<sub>2</sub>O<sub>3</sub> - ~10 %. [9]

Prominent feature of a technogenic waste is the high maintenance of arsenic (2,2-5,2 %, an average of 3,5 %) which mainly contain in the kind of less-soluble combinations – Mg (NH<sub>4</sub>)<sub>2</sub>AsO<sub>4</sub>·nH<sub>2</sub>O and Mg<sub>3</sub>(AsO<sub>4</sub>)<sub>2</sub>·nH<sub>2</sub>O, formed as a result of technology application of magnesian purification of arsenic solutions that is it is unsafe for environment. Partially (10-20 %) arsenic is presented as arsenides of the metals which have not decayed in the process of autoclave lixiviation.

It is offered to take selectively arsenic, by bacterial lixiviation.

Slime preliminary passes crushing in cone, cheek lobe crushers and crushing in drum-type mills with metal crushing bodies (spheres, cores).

Further the product arrives on preliminary arsenic lixiviation in tubs. Despite of the relative high cost, the given method possesses of advantages:

–we can supervise and can operate, for fine-crushed products that the process of bacterial oxidation is developing,

–high degree of selectivity accelerates at extraction of valuable mineral products, – it is simple to use the equipment,

–low-temperated,

–without harmful waste emissions into an atmosphere,

–with the possibility of creation of the closed water turn, i.e. ecologically safe water turn.

Speed of process basically defines the technology of lixiviation and its profitability.

The insoluble residuum which is rich of heavy, nonferrous metals (Co, Cu, Ni, Au, Ag), goes on bio-

lixiviation at the presence of thionic, mutating bacteria, and also by heterotrophic microorganisms.

After that the solution goes on gold and silver extraction, and on the insoluble residuum for cobalt, nickel and copper extraction.

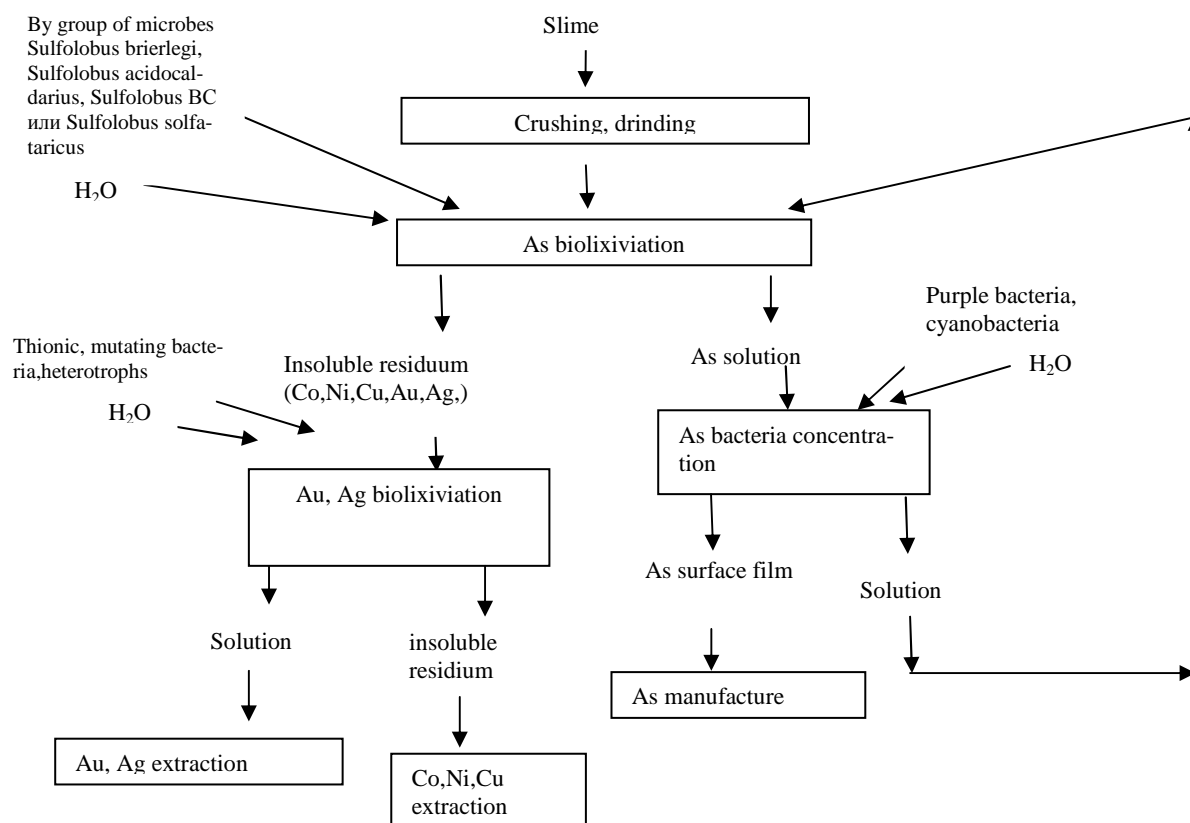
There are bacteria in arsenious solution nourishing arsenic.

The researchers from Geological service of the USA (USGS) have found out the strain of bacteria which use the connections of arsenic as a source of energy.

These bacteria form surface films on a water surface containing considerable concentration of arsenic connections, washed away of rocks by thermal springs.

The formed film goes on arsenic manufacture.

The solution comes back in a turn.



**Figure 1.** The offered technological scheme of processing slimes at the industrial complex “Tyvacobalt”

### Conclusion

The use of biotechnologies is rather perspective for the world. If we even take biogeotechnologies – alluvial gold which is rather easy for extracting, using gravitational receptions, in the world and including in Russia runs low. Another technologies are needed for extraction of precious metals from a scattered condition, from deep-seated and compound-structured ore bodies. Nowadays several basic technologies for enrichment of ores of precious metals are used. These are compact lixiviation, gravitatively flotational cycle,

coal in a pulp (CIP), biolixiviation. The utilization of metals biolixiviation is simple, effective, non-polluting and the economically cheapest way from existing technologies of processing of ores.

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*Materials of a Conference***THE MAN'S COURSE OF LIFE –  
THE PERSONALITY AND THE SUBJECT  
ACTIVITY HISTORY**

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The course of life subjective picture in the man's self – consciousness is always being built, accordingly to the individual and to the social development, having commensurated in the historical – biographically dates. The human consciousness «historical method» is being spread and popularized onto, in fact, all the things and the objects, having created and having done by the people in the social and the public production process, and also having formed the man – made habitation medium, which is being situated in the natural habitation environment. The man's inclusion into the social life and his involvement into the public life, as the completely independent figure and the personality, and the activity beginning fact itself have the fundamental and the significant importance for the man's course of life. All the preceding development (e.g. from the birth up to the maturity) is being coincided with the upbringing, the education, the teaching, and the training stepped sequential system of the forming man. So, all these steps, successively, having interconnected and also, prospectively, having orientated to the man's training and the following preparation for the independent life in the society, are being made up yet only the man's course of the life preparatory phase. In the genetic relation, this phase is exceptionally significant not only the fact, because the upbringing, the education and the training is the society's directed influence fundamental form upon the growing man, the social administration and its management by the process of his further formation, as the personality. Not at least, it is so significant the fact, that the man is being formed and is being made up, as the subject's public conduct and the social behavior, his readiness to the labor is being taken shape and emerged in the personality social and the public formation process [1, 2, 3].

The gradual transition from the upbringing, the education and the training to the self – upbringing, the self – education and the self – training, from the upbringing, the education and the training subject to the upbringing, the education and the training subject position is being revealed in many intellectual and the moral phenomena of the man's activity. So, this process common effect is the life plan, with which the young men and the young women are starting out in their independent life.

The vocational and the occupational choice, the value orientation for that or another social and the public life sphere, the ideas and the targets, which, in

the very general view, are being defined the social conduct and the public behavior and also the relations on the threshold of the independent activity, – and all these are the separate and the certain moments, having characterized the independent life starting just in the society.

The social and the public activity development phase character is being revealed in the principal and the basic (e.g. creative, vocational, and occupational) activity states change, and it is quite able to be, more or less, exactly being determined by the biographical – chronologically method. B.G. Ananjev [2] singles out the following course of the life phases: 1) the preparatory one; 2) the starting is being considered, as the independent inclusion and the involvement period into the social and the public life; 3) the culmination or «the peak» – the highest achievements just in the chosen activity; 4) the finishing – the subject's activity and the learning, and the cognition development process completion, that is being depended not only from the ageing, but also and from the personality's relations, the positions, the living conditions whole aggregate in the society. The each one from all these phases is being characterized the subject activity structural change.

The case is in somewhat considerably more complex and complicated with the analogous and the similar phases in the man's development history, as the personality. Beyond all doubt, the personality and the subject development preparatory phases are being completely coincided. However, it is quite possible to be determined the personality formation focal points and the highlights, the stabilization and the finishing only by means of the shifts and the displacements comparison by the man's social and the public development many parameters: by the civil status, by the economic situation, by the family status, by the social and the public functions combination, and the cumulation, by the social and the public functions consolidation or the separation, by the development and the communication medium change, by the conflict situations, and by the vital challenges solution, by the life plan realization or the non – realization, by the success or by the unsuccess – by the triumph or by the defeat in the struggle [1, 2, 3].

The personality and the subject activity history is being developed just in the ontogenesis real space and the time and, to a certain degree, is being defined by them. And, increasingly, in a larger measure, it is so significant to be taken into consideration also and the social and the public development reverse influence upon the human nature change and the man's course of his life upon his ontogenetic evolution.

The new genetic psychology had been come, as B.G. Ananjev wrote [3], from the mental development and the further mental growth comprehension, as the both different and various series, in essence, dialectical



unity. The natural development series is, by his definition, one from all these series, the other one – is the cultural or the social and the cultural development. The question is on, so called the child's heightened sensibility and the hypersusceptibility sensitive periods to the external influences, especially to the teaching and the upbringing, and the education, and the training process influences, that is, the intellect and the personality social and the public formation.

The forming man's way of the life are being exerted their influence upon the growth rates and the further maturation, and also the work and the activity methods, which are the following – the playing one, the sporting one, the educational one, the labor one and the social conduct and the public behavior, the life regime, the meals, the sleeping, and the wakefulness eubiotics, which are closely connected with the personality status, the stresses' presence or its absence, the most principal of which are the conflict situations and so on and so forth. All these above – mentioned factors are of the utmost importance and the significance not only by themselves, as the personality – the subject formation moments, but also, as the forces, having exerted upon the following man's organic development just in the defined and the specified his ontogenesis moments. As this development determinants, they are usually being played the stimulators' role, having promoted the growth and the maturation processes, or, on the contrary, the stresses and the depressors, having detained all these processes, but in a number of the cases – the catalysts, having accelerated the other factors action [3].

The sports peculiarities and the specific features consideration, as the socialization and the social growth factor is being forestalled and anticipated by the man's formation theoretical analysis, as the activity subject. So, personal entry peculiarities and the specific features into the occupational and the vocational activity, its capability to the labor activity self – regulation and the self – programming are being revealed in the works and papers of B.G. Ananjev [3], O.A. Konopkin, V.D. Shadrikov [9], A.N. Leontjev [4] and the other psychologists. The man is being included, and he is being involved into the activity, as the personality in the existing or the becoming its relations to the world aggregate, to the events, to the tasks, to the life, on the whole, and to himself.

The activity subject formation is being assumed the individual activity public (e.g. social, vocational and occupational and so on, and so forth) regulation, its control by means of the activity conditions organization, the climate making in the staff and etc., on the one hand. On the other hand – the personality, as the activity subject is not only being developed his professional and the vocational skill, but and he is being revealed his personal activity and the self – regulation organization capability.

The personality study and the examination is being begun from his status definition, for all this, the

personality oneself is being considered, as the development social and the public situations collective effect, as the different social and the various different structures and the historical processes influence object. However, it has already been turned out at the personality status study and the examination, that its activity measure is being increased in its own and proper status preservation or the transformation, depending on the social and the public community (e.g. of the class, of the stratum, of the group), to which it is being belonged to, as far as possible, its formation and the further development. So, the active, and the subjective status side is being acted, as in the form of the personality position, which is being occupied under the defined and the specified status conditions [5, 8].

As the sociology, well as the psychology are being paid their attention just on this combination peculiarity and the specific feature in the object and the subject qualities and the behavior human personality [3]. The personality position, as the social conduct and the public behavior subject and the diverse social and the varied public activity, is being presented the personality relations complex system (e.g. on the whole, to the society, to the labor, to the people, to himself), the purposes and the motives, which he is being guided by in his activity, the targets and the values, at which this activity is being directed. Thus, all this complex objective qualities and the behavior system is usually being realized just in the defined and the specified, social and the public functions – roles complex, having carried out by the man in the given social and the specified public development situations [8, 102].

In spite of the fact, that the personality, as the social and the public individual, is always carried out the defined social and the specified public functions, each of them is being realized by means of the original social conduct and the peculiar public behavior, he is being made and is being built in the form of the quite known conduct and the behavior systems, and having conditioned their motivations and their reasoning. All these conduct and the behavior, the motives and the social and the public functions systems of the personality, on the whole, are being determined by the morals and the rights standards, and also the other social and the public development phenomena. They are being orientated and are being directed toward the defined and the specified social conduct and the public behavior standards. The man's every activity is practically being carried out in the subjective and the objectively relationship system, that is, the social relations and the public interconnections, which are being formed the man, as the social being and the public creature – who is the historical process personality, the subject, and the object.

The man is cognizing the surrounding world and the world around, and he is changing constantly it in the process of his every activity. So, the activity, having directed toward his own needs and the proper

demands satisfaction, and also the requirements to him from the society and the state side is being comprehended under the man's activity. So, the human life is quite impossible without any kind of the activity. The needs and the demands are being the personality's activity chief and the principal source. The personality's all sides are being revealed in his activity, and exactly the needs and the demands are being made the man to be acted. So, the need and the demand – this is the necessary motive to his activity, which, in its turn, is being realized, and it is being experienced by the man, as the need of something or the want of something [6, 9].

Thus, it is quite possible to be concluded, that the activity (e.g. the labor and the learning, and the cognition; the game and the studies, the sports and the various kinds amateur talent activities and the different amateur performances) is being carried out only in these relations and in these interconnections system. Therefore, the activity subject – is the personality – and he is being characterized by those or another rights and the obligations, which the society is being appropriated to him, by the functions and by the role, which he is playing just in the small group, in the staff, and in the society, on the whole. It is quite impossible the activity subject definition beyond the historically emerged object activity form, as the subject – the activity object – the activity means – are being made up the ensemble and the single and the organic whole. So, the activity is the man's principal object activity, on the development basis of which all the other forms, including the game, and the studies, and the learning have been arisen and have been appeared [7].

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## Materials of Conferences

**THE KEMEROVO CITY ENVIRONMENTAL POLLUTION ECOLOGICAL MONITORING**

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The Kemerovo city atmospheric air pollution specific feature and its peculiarity is the fact, that the chemical and the chemical – recovery enterprises and the productions atmospheric emissions and the organized industrial discharges are constantly being met, such as the ammonia, the aniline, the amines, the chlorides, the carbon bisulphide, the isopropyl alcohol, the cyanic hydrogen and the others, at the same time with the widely – spread motor vehicles and the motor transport and also the heat and power engineering emissions [1,6].

So, the atmospheric air pollution most typical specific features and its peculiarities of the Kemerovo city territories, which are built – up, having intended for the following buildings, the gardens and also the roads by the chemical and the chemical – recovery enterprises and the productions atmospheric emissions and the organized industrial discharges have already been singled out by means of the cluster analysis [5].

They are being consisted in the fact, that: firstly – such the leading atmospheric air pollutants, as the ammonia, the carbon bisulphide, and the formaldehyde are usually being defined the general situation just in the air basin on all the territories, which are being under the control; secondly – by the concentrations totality, the city territory leading harmful substances are being divided into the several and some groups with their atmospheric air pollution likeness unequal and the different degree; and, at last, thirdly – the chemical and the chemical – recovery enterprises and the productions smoothing influence upon the situation with the atmospheric air pollution of the zone, which is built – up, having intended for the following buildings, the gardens and also the roads is being expressed in the more degree, than at the atmospheric emissions from the heat and the power plants, the motor vehicles and the motor transport, and also from the other enterprises, and the productions.

So, it can be seen from the Table No.1, that the Kirovsky district is being occupied on the first place (e.g. 34,21), the Zavodskoy, the Czentralny, the Leninsky districts zones, which are built – up, having intended for the following buildings, the gardens and also the roads are being occupied on the second place (e.g. 15,32; 15,22; 11,96, correspondingly) [3,4] by the atmospheric air pollution index (AAPI) average value in the Kemerovo city's districts zones, which are built – up, having intended for the following buildings, the gardens and also the roads for the previous 7 years (e.g. 1997 – 2003 years).

**Table 1.** The Atmospheric Air Pollution Index (AAPI) in the 1997 – 2003 years

The District	The Average Value	The Tendency Rate
<i>The Kirovsky one</i>	34,21	-1,02
The Zavodskoy one	15,32	-2,46
The Czentralny one	15,22	-1,72
The Leninsky one	11,96	-1,80
The Rudnichny one	8,62	-0,37

The atmospheric air pollution index (AAPI) least mean value among all the districts and, moreover, the statistically significant one has been in the Rudnichny district (e.g. 8,62,  $p < 0,05$ ). For all this, the highest tendency rate to this indicator and the sign decrease has been registered in the Kirovsky district (e.g. – 2,46); so, the atmospheric air pollution index (AAPI) tendency rate lowering has been varied in the range of from – 0,37 down to – 1,8 in the other districts.

Thus, the carried out analysis by the atmospheric air pollution index aggregate indicator (AAPIAI) average values for the previous 60 months or for the 5 years (e.g. 1999 – 2003 es.) has been shown, that having had the highest values by the phenol, the formaldehyde, the carbon bisulphide, the dust,

and the ashes in the Kirovsky district, it has been observing also the highest tendencies to their decrease (see, the Table No.2). The atmospheric air pollution index aggregate indicator (AAPIAI) average values by the phenol, the formaldehyde, the carbon bisulphide considerably have not been differed in the other districts, when it depends the least value has been in the Rudnichny district (e.g. 0,11) with its minimum tendency rate to the lowering (e.g. – 0,01) by the dust and the ashes. The least tendency rate to the atmospheric air pollution index aggregate indicator (AAPIAI) decrease by the phenol has been observed in the Zavodskoy district (e.g. – 0,10), and by the formaldehyde – has been observed in the Leninsky district (e.g. – 0,15).

**Table 2.** The Atmospheric Air Pollution Index Aggregate Indicator (AAPIAI) in the 1999 – 2003 years

The district	The Phenol		The Phormaldehyde		The Carbon Bisulphide		The Dust, the Ashes	
	The mean value	The tendency rate	The mean value	The tendency rate	The mean value	The tendency rate	The mean value	The tendency rate
The Kirovsky	0,63	-0,14	4,34	-0,70	2,98	-0,42	0,99	-0,21
The Czentralny	0,44	-0,11	2,91	-0,49	1,36	-0,35	0,37	-0,07
The Leninsky	0,38	-0,10	3,16	-0,15	1,29	-0,26	0,16	-0,02
The Rudnichny	0,36	-0,08	3,20	-0,45	1,48	-0,31	0,11	-0,01
TheZavodskoy	0,32	-0,05	3,07	0,29	1,24	-0,31	0,38	-0,05

It has been observed, at the special tests percent average value calculation on the suspended solids concentrations in the atmospheric air (e.g. 2001 – 2003 es.) in the Kemerovo city's different districts, that the Kirovsky district has the highest its value (e.g. 2,45), the Zavodsky district is on the second place (e.g. 0,94), and in the contrast to the other districts, it has the tendency to the following increase (+0,64).

If to estimate the atmospheric air pollution total indicators and the signs, then the Kirovsky district has the highest average values for the 48 months or for the 4 years (e.g. from 2000 till 2003 – es.) as by the atmospheric air pollution degree by the separate substances (e.g. the «P» value), well as by the «K<sub>total</sub>» hazardous and the harmful substances complex pollution total indicator and the sign, having had the highest average values, (e.g. 9,39 and 10,77, correspondingly). However, the Kirovsky district has the highest tendency to the following lowering by the «K<sub>total</sub>» indicator and the sign (e.g. – 1,42). Thus, the Rudnichny district has the highest tendency to the following lowering by the «P» value (e.g. – 1,08), at the same time, the highest tendency to the following increase is being observed at the Zavodskoy district (e.g. + 0,88).

By its complex anthropogenic load on the atmospheric air (e.g. K<sub>atm.air</sub>), the Kirovsky district is being on the first place (e.g. where the average value for the 84 months or for the 7 years, that is from 1997 till 2003 – es., it is equal to 31,65), the Czentral district – is being on the second place (e.g. the average value – 18,84). Thus, the Czentral district has the highest tendency to this indicator and the sign lowering (e.g. – 1,58).

The solid industrial wastes and the concentrated liquid industrial wastes (e.g. SIW and CLIW), the spilled and the poured out raw materials, and the finished commodity and the integrated products at the chemical enterprises' territories during the equipment storing, the transportation and the operational service are the main soil and the ground contamination sources.

The soil and the ground contamination is being observed together with the following hazardous and the harmful substances migration into the adjacent mediums with the soil and the ground in the places of the chemical and the chemical – recovery enterprises

and the productions placement. So, it is taken its place in the buffer belt zones (e.g. BBZ), the suburban and the zones, which are built – up, having intended for the following buildings, the gardens and also the roads – in the result of their settling upon the soil and the ground just from the atmospheric emissions and the organized industrial discharges.

The chemical and the chemical – recovery enterprises and the productions the atmospheric emissions and the organized industrial discharges influence upon the Kemerovo city's soil and the ground contamination has been tracking in the 12 – 15 km radius. The atmospheric pollutions and the organized industrial contamination influence parts upon the phenol, the formaldehyde, the sulphates and the ammonia concentrations increase probability in the soil and the ground have been made up in the range of 47 – 78%.

The Kemerovo city's chemical enterprises and the productions territories are being considered, as «the extremely dangerous ones», the industrial wastes storage sites – «the dangerous ones», the buffer belt zones (e.g. BBZ), and the zones, which are built – up, having intended for the following buildings, the gardens and also the roads – «the moderately dangerous ones» by the ground chemical contamination total index (GCCTI).

Thus, the ground chemical contamination total index (GCCTI) average values by the Kemerovo city's districts for the 60 months or for the 5 years (e.g. 1999 – 2003 es.) are being varied in the range of from 19,89 up to 26,33. However, the Rudnichny district has the tendency to the following its lowering by this indicator and the sign (e.g. – 2,48), it depends when the Leninsky and the Kirovsky districts have the tendency to the following its increase (e.g. +2,33 and +2,23, correspondingly).

So, the soil and the ground contamination hygienic and the sanitary significance by the hazardous and the harmful substances, including the organic contaminations, is being defined by the fact, that it is being considered, as the main and the master link in the xenobiotics circulation [2].

So, it should be necessary to be considered at the natural environmental pollution and the contamination composition and the levels consideration, that the hazardous and the harmful substances in the towns

and the cities with the much developed chemical industry, having contained in the atmospheric emissions and the organized industrial discharges, SIW (e.g. the solid industrial wastes) and CLIW (e.g. the concentrated liquid industrial wastes) are quite able to be mutually interacted between each other or to be transformed in the atmosphere, the reservoirs, and also in the soil and the ground with the following the other ones formation, including the more dangerous chemical compounds. So, it should be taken into the consideration the chemical substances transformation at the pollution and the contamination levels definition, the control organization, and the cause – and – effect relationship establishment between the environmental pollution and the following contamination, and also the population health state.

Thus, the average values for the 84 months or for the 7 years in the different city's districts statistically and probably significant are not quite being differed one from each other, by their complex anthropogenic load upon the soil and the ground (e.g.  $K_{soil}$ ) and, on the whole, upon the ambient environment (e.g.  $K_{load}$ ). All these indicators and the signs have their tendency to the following increase in all the city's districts.

It also has been cleared out, having estimated the hazardous and the harmful substances discharge facility with the sewages by the Kemerovo city's main chemical enterprises and the productions, that «the Khimprom», that is «the Chemical Industry» is being discharging the suspended substances with the sewages the most of all, in comparison with the others (e.g. 47,23 ton./year) in average for the 36 months or for the 3 years (e.g. 2001 – 2003 – es.), and «the Azot», that is «the Nitrogen» – the total nitrogen, the nitrates, the oil and the petrochemical products (e.g. 80,13 ton./year, 1002,04 ton./year, 2,87 ton./year, correspondingly) [4].

The Hydro – Electric Power Station (HEPS) and the Novokemerovskaya Thermo – Electric Power Station (TEPS) are being leading among them in the Kemerovo city, by the non – utilizable waste products quantity (e.g. 226,094,1 ton./year and 200,698,4 ton./year), in average for the 36 months or for the 3 years (e.g. 2001 – 2003 – es.).

They are being deserved their attention, such as the microorganisms total amount lowering, which has been revealed in the chemical enterprises and the productions, and also the Kemerovo BBZ (e.g. the buffer belt zones) territories soil and in the ground, the humicular microflora reduction in it, which are quite able to be resulted in the biogeocenoses disorder and the soil and the ground self – cleaning possibility lowering towards, as to the natural substances, well as to the anthropogenic pollutions.

So, the chemical productions and the enterprises are usually being presented the hazardous danger, also, as for the superficial waters, well as for the underground waters. The production sewages and the storm discharges and the floods run – off just from the

chemical enterprises and the productions territories are usually being served, as the pollution and the contamination main sources. The industrial storm discharges and the floods run – off are directly being thrown down into the reservoirs, in the overwhelming majority cases, and they are being characterized by the hazardous and the harmful substances high level concentrations, as the reservoirs pollution and the contamination sources.

The superficial waters and the underground waters hazardous pollution danger by the storm discharges and the floods run – off from the territories not only the enterprises and the productions, but also and BBZ (e.g. the buffer belt zones) is being presented in the cities and the towns with the advanced developed chemical industry.

The Kemerovo industrial complex and the center, having had the concentrated chemical enterprises, the productions, and the chemical – recovery plant, is being thrown annually: the 1,2 tons aniline, the 1,4 tons phenol, the 6,9 tons methanol, the 0,5 tons cyanides, the 45,1 tons caprolactam, the 2,5 tons formaldehyde, the 46,6 tons nitrates, and the 2,2 tons thiocyanates with the sewages into the reservoirs.

The sewages composition hygienic and the sanitary significance from the chemical productions and the enterprises is being conditioned by the fact, that they are considerably being widened the reservoirs pollution spectrum by the hazardous and the harmful substances, they are being given the toxic qualities to the superficial and the underground waters, they are adversely being affected upon the reservoirs hygienic and the sanitary regime, they are being promoted to the more toxic chemical compounds formation, for example, the trigalomethanes, which, in their turn, are being characterized by their genotoxicity.

The volatile chlorine – organic compounds (such as, the tetrachlorated carbon, the dichloromethane, the trichloromethane, the trichloroethylene), the amines (such as, the monomethylamine, the dimethylamine, the trimethylamine, the diethylamine), the phthalates (such as, the propylphthalate, the dioctylphthalate, the dibutylphthalate, the butylizobutylphthalate), the caprolactam, the caproic acid, the phenols (such as, o – chlorphenol, the 2,6 – csylenol, the thymol, the methylphenol, the o – cresol, the ethylphenol), the bromoganic chemical compounds (such as, the bromoformum, the bromdichloromethane) and the others have been found out down the city's river, in the Tomj river.

The hazardous and the harmful substances, having thrown down by the chemical enterprises and the productions into the water – sources, are being the initial products for the further transformation, especially at the discharges and the floods run – off, and the drinking water chlorination. So, the trigalomethanes challenge in the drinking water is quite the well – known one, having consisted in the chloroform, the dichlorbrommethane, the chlormethylene forma-



tion and the others at the waters chlorination, having contained the organic impurities, as the anthropogenic, well as the natural origin.

Thus, the complex anthropogenic load upon the drinking water (e.g.  $K_{\text{water drink.}}$ ) by the Sanitary and Epidemiological Service (SES) data has the same values in all the city's districts (e.g. the average value for the 84 months or for the 7 years – has the 28,17; the tendency to the growth +12,15).

The environmental pollution analysis and the contamination by the chemical substances, which are being the highly level toxic and the carcinogenically hazardous and dangerous ones for the people, is being given the possibility for the subsequent investigations of the cause-and-effect relations between the environmental pollution, and the contamination, and also the Kemerovo city's population socially significant diseases and the illnesses for us.

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#### RECYCLING OF OIL-SLIMES BY CHEMICAL METHOD

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Oil-slimes, formed during manufacturing process, transport and oil refining, accumulate in huge quantities on a territory of oil refining factories and nega-

tively influence atmospheric air, hydrosphere and letosphere. More over oil-slimes belong to the most persistent environment pollutants.

There are some methods of oil-slimes recycling, which include methods of division into three phases with use of special substances - demulsifying agents, methods of creation fuel compositions, methods of hardening and burning and so forth. The choice of a method depends on their origin, composition and structure. As a rule in most cases it is enough to know the quantity of mineral oil, water and mechanical impurities to choose a direction of the oil-slimes usage.

So, at first the phase structure of oil-slime is determined. Oil-slimes contain water 26,25 %, mineral oil 33,75 %, mechanical impurity 40,00 %.

For recycling of oil-slimes it is offered the way of its processing by chemical method with lime-containing reagents. As an adsorbent it was suggested to use exhausted silica-gel – gas industry waste on the stage of gas dehydration. The given technology of joint recycling of oil-slimes and exhausted silica-gel allows converting viscous-flowing oil-slimes into combined and safer powder state. The essence of the method consists in the interaction of components, which leads to the formation of dry, waterproof powder substance. Silicon oxide exhausted silica-gel plays a role of the dehydrating agent and influences the process of granulation, carries out functions of adsorbent of hydrocarbons and also influences a migration of contaminants into water.

The compositions of quicklime and exhausted silica-gel are investigated. It is established the proportion of those components depends on the quantity of mineral oil in the oil-slime and may be from "one to one" to "one to two". The quantity of silica gel can be up to 30 %.

For the substantiation of the ecological safety of oil-slimes recycling products it was analyzed their water extracts. From this analysis it follows that a migration of contaminants into water is less than in case of waste. Calculation of danger class is also carried out. Oil-slimes recycling products fall under the category of the 4th danger class.

As a result both oil-slimes and exhausted silica-gel are neutralized and utilized and can be used as a secondary raw material, for example, in manufacture of building materials.

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