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## THE INFLUENCE OF TECHNOLOGICAL ADVANTAGES ON THE ECONOMIC DEVELOPMENT OF KAZAKHSTAN

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This research analyses the influence of technological advantages on the economic development of Kazakhstan. Here authors touch upon the issue of technical and technological backwardness of Kazakhstan enterprises, the absence of effective connection between science and manufacture, low costs on research and experimentally-engineering works, discrepancy of management to the tasks of adaptation of economy to the processes of globalization and conversion to the service-technological economy.

In the research there were used the showings of innovative activeness of Kazakhstan enterprises from 2003 till 2008 years, the structures of innovative production of the Kazakhstan republic, the number of created and used new technologies and objects of technique in Kazakhstan, the costs on the technological innovations of enterprises by the sources of financing, there was carried out the descriptive analysis of facts. The discussion was aimed at the revealing of reasons of low innovative receptivity of Kazakhstan economy.

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Keywords: the rise of producing, technological changes, innovations

The processes of globalization raise the number of problems to the Kazakhstan economy, the main sense of which boils down to the necessity of raising the competitiveness not only of enterprises but also of their producing production. Meanwhile technological changes, which were caused by the use of new scientific achievements, change the contours of traditional sector, promote more rapid forming of new technologies at the sphere of computerization, biotechnology, energetic, communication and space researcher, where employment increases rather dynamically, than at other spheres of traditional economic activity.

Thus, in the most developed technically country in the world USA, the average annual growth of producing high technological goods (HTG) during the period from 1998 till 2008 year formed at the sphere of computer and office equipment producing 14,5%, producing of electronic components 10,9%, computer treatment of the facts 10,3% and producing of communicative equipment 8,1% (table 1).

With regard to Kazakhstan specific, where are successfully realized structural in-

stitutional reforms, there are observed more rapid temps of growth of the export potential of the country and there is no adequate growth of the sectors of manufacturing industry. Materially economy of Kazakhstan concerns energy and labor-consuming, badly adapted to the realities of outer competitiveness. By the level of costs of electric energy on 1 dollar of Gross Domestic Product (GDP), and also by the productivity of labor at the sectors of economy Kazakhstan falls behind some industrially developed countries more than 7–10 times. The basic funds of Kazakhstan enterprises fall into decay.

To the beginning of 2009 year the degree of wear of basic means was at the average 50–60%. At the number of sectors the physical wear of basic means was near to 70% and more. For the comparison, to the producing of 1 dollar of GDP in Great Britain, Germany, Italy and Japan, there are expended 0,22–0,3 kilowatt-hour, in the USA, France, Turkey, Korea – 0,4–0,6, in Canada and China – 0,8–1,2 kilowatt-hour, whereas in Kazakhstan these costs are 2,8 kilowatt-hour. In the country there

is observed the sectoral imbalance of the costs of labor on the producing of the unit of realized production, what also promotes

the warp in the income of population by the sectors, creates the tensivity by all levels of budget of the country [1].

**Table 1**

The dynamics of producing and growth of employment at separated spheres of high technological goods in the USA in 1988–2008 years

Spheres of producing	Producing of high technological goods, millions of dollars			The average showing of grows, %	
	1988 year*	1998 year*	2008 year**	1988–1998 years	1998–2008 years
Computer treatment of the facts	77	219	584	11,1	10,3
Producing of electronic components	55	203	571	13,9	10,9
Producing of communicative equipment	38	78	169	7,6	8,1
Producing of computers and office equipment	50	446	1723	24,6	14,5

Sources:

\* World Employment Report 2001: Life at Work in the Information Economy. ILO. – Geneva, 2001. – P. 119.

\*\* Kasimov S.M. New technological order: tendencies of employment and education // Transit economy. – 2009. – №3. – P. 45.

The general technical and technological backwardness of enterprises, the absence of effective connection between science and manufacture, low costs on the research and experimentally-engineering works, discrepancy of management to the tasks of adaptation of economy to the processes of globalization and conversion to the service-technological economy, this is not full list of problems, which hold back further forward development of national economy. The low part at the export of production that was made with the use of average and high technologies, prevent Kazakhstan to occupy the deserv-

ing place in the world division of labor. In the structure of Kazakhstan export there prevail raw materials and metals, and are practically absent finished goods. The degree of diversification of export there is suggested by the following fact. The developed countries export 179–181 types of goods, Argentina – 148, Saudi Arabia – 128, when Kazakhstan – only 21. If the index of trade structure of export in the developed countries is 0,24–0,37, then in Kazakhstan – 0,87. While the continuation of such scenario of development Kazakhstan would be able to turn into rough adjunct of developed states [2].

Countries, which can't provide the necessary level of the population's education, of the science and technology development, of the quality of informative sphere, will be doomed to the deeping into dependence on outward financial and informative centers and will reserve the functions of the source of natural raw materials and human material for the TNK from the developed countries, which concentrate the global intellectual potential [3]. It's known that while the processing of the oil by the energetic scheme the summary cost of received oil products exceeds the cost of feedstock only 4 times, and by the petrochemical scheme – 40 times. The potential value of hydrocarbon resources while producing of final synthetic fibers exceeds the cost of raw oil practically 100 times. The rough value of exported tungsten concentrate is 600 dollars of USA per ton, metallic tungsten 6 thousands, wire 60 thousands of dollars per ton and tungsten tape – more than 100 thousands of dollars per ton.

At the base of innovative assessment of the production capacity, which includes the commercial use of knowledge and ability to produce and realize competitive production, there is based the classification of technological capacity of trade (TCT) that was developed by the United Economical Union of Development (UEUD).

The technological capacity of trade (TCT) is the part of costs on researches, development and use at the volume of producing and trade of goods of separate sectors and presents the degree of relative innovation of good. Accordingly to the goods specialization by the level of technological capacity (UTET) (the level of relative innovation) of goods by the classification OESR, Kazakhstan Republic belongs to the countries which produce mainly middle and low technological traditional goods, and by the level of economical develop-

ment is at the level of before industrial and industrial stages at the development in the group of developing countries with overtaking development (table 2).

By the facts of specialists, at the market of high technological goods, by the cost 1 kg of optical, radio-electronic and gyroscopic elements is virtual to the 110 tons of oil and practically 2 times more expensive than 1 kilogram of gold. By the average facts depending on the type of used space apparatuses the launching into the space of 1 kilogram of commercial goods is at the limits from 20,0 till 40,0 thousands of dollars of USA. 1\$, which was deposited into electronics, brings 100\$ at the final product [3].

Thereby, the forming of technological advantages of the state is impossible without creation and introducing of innovations. In the Kazakhstan today there is observed the decrease of activity of enterprises at the sphere of creation and spreading of innovations. By the assessments of the Agency RK statistic says, that 01.01.2009 year the specific weight of innovatively active enterprises in the republic was 4,0 % from the general number of respondents (11172 units). Previous years it has following level: 2007 year – 4,8 %, 2006 year – 4,8 %, 2005 year – 3,4 %, 2004 year – 2,3 %, 2003 year – 2,1 % [4]. For the comparison the specific weight of innovatively active enterprises in Russia is 13 % (2008 year) [5], in the countries of East Europe – till 40 % (Rumania – 28 %, Slovenia – 32 %, Poland – 38 %), in the countries of OESR – near 50 % [6].

In the regional section in the innovative development there are leaders: Karagadinsk region (innovative activity 6,5 %), Almaty city – 6,4 %, Jambylsk region – 6,0 %. Among the falling behind there are unexpectedly singled out: Astana city – 1,8 %, Almaty region – 1,9 %, Mangistausk region – 1,9 %.

**Table 2**

The level of technological capacity (UTET) (the level of relative innovation) of goods by the classification OESR, in %

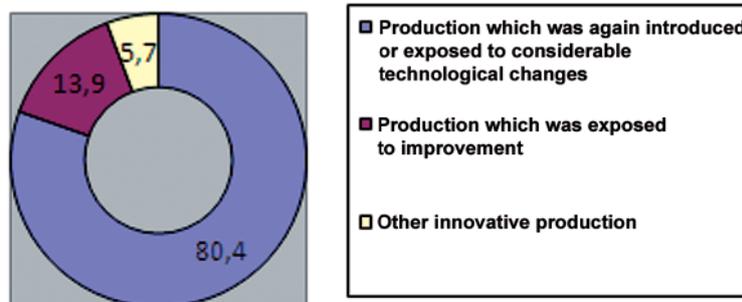
Name of goods	Technological capacity of goods, in % (TCT)	The level of technological capacity (UTET) (the level of relative innovation) of goods	Goods specialization of the Kazakhstan Republic
Aerospace equipment	22,7	High technological goods TCT = 11,4%	
Office equipment and computers	17,5		
Electronics and its components	10,4		
Medicines	8,7		Medicines
Devices	4,8		Devices
Electrical equipment	4,4		Electrical equipment
Automobiles	2,7	Middle technological goods TCT = 1,7%	
Chemicals	2,3		Chemicals
Other industrial goods	1,8		Other industrial goods
Non-electrical equipment	1,6		Non-electrical equipment
Rubber, plastic	1,2		Rubber, plastic
Nonferrous materials	1,0		Nonferrous materials
Brick, clay, glass	0,9	Low technological goods TCT = 0,5%	Brick, clay, glass
Food, tobacco	0,8		Food, tobacco
Vessels, oil, ferrous materials	0,6		Vessels, oil, ferrous materials
Products from metal	0,4		Products from metal
Paper, wallpaper, tree, furniture	0,3		Paper, wallpaper, tree, furniture
Fabrics, clothes, shoes	0,2		Fabrics, clothes, shoes

Source: [3]

While this, the general picture of innovative processes in the country on 01.01.2009 year was defined practically by one sector – metallurgy (84,4% of all manufacturing innovative production of RK). The second position is occupied by building – 9,6%. At the third level is chemical industry – 3,8% and mining industry – 2,1%. Among the outsiders there turned out agriculture (produced innovative production to the 284,1 million of tenge or 0,1%) [4].

In addition, nowadays one can notice, that Kazakhstan enterprises at the

sphere of innovative activity have generally chosen «overtaking» strategy, what testify to their innovative unreceptiveness. «Overtaking» strategy means the imitation of foreign technologies, copying of products and their mass producing [7]. Thus, from all realized in the Kazakhstan innovative production on 01.01.2009 year at the sum of 111531,1 million of tenge, production, which was again introduced or which went through the considerable technological changes, was 80,4%, while this the part of really on principle new production is still unknown (Fig. 1).



**Fig. 1.** Structure of innovative production PK for 01.01.2009 y.

In comparison with previous years, the part of production which was again introduced or which went through the considerable technological changes, changed in following way: 2003 year – 14,7%, 2004 year – 28,6%, 2005 year – 36,7%, 2006 year – 56,7%, 2007 year – 70,6%. That shows the undeniable tendency of growth [4].

The low ability of enterprises of carrying out of innovative activity is defined by low level of receptivity of economy of republic to the innovations. Nowadays the demand is not oriented at the use of advanced manufacturing sciences, which are character for the modern level of scientifically-technological progress. By the facts of Agency RK the statistic says that during 2008 year, from the 578 created new tech-

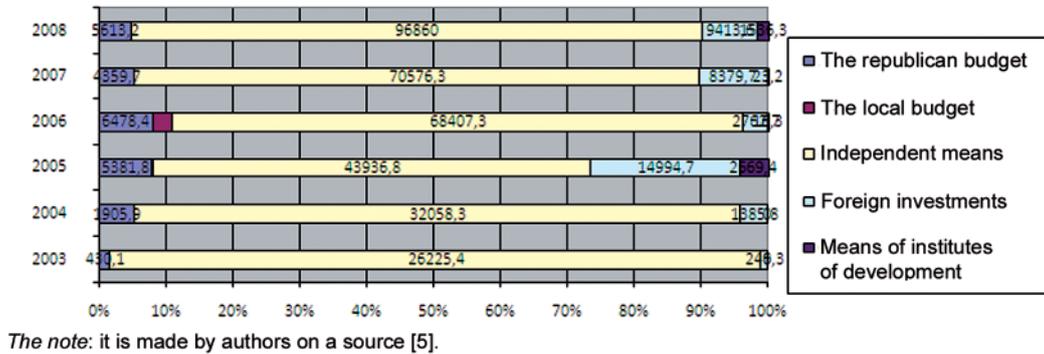
nologies and objects of technique only 245 of them were used in practice [4]. While this the capital deposits of enterprises, including deposits into the innovative activity, enterprises have to do generally by the expense of their own means, the inflow of investment money from without is still not considerable (Fig. 2).

The ways of solving of this problem by other countries are well known. This is, for example, the creation of Research Institute by joint efforts, HEIs and industrial companies of new innovative enterprises, or «start-up» of companies, which are oriented to the commercializing of the results of scientific researches.

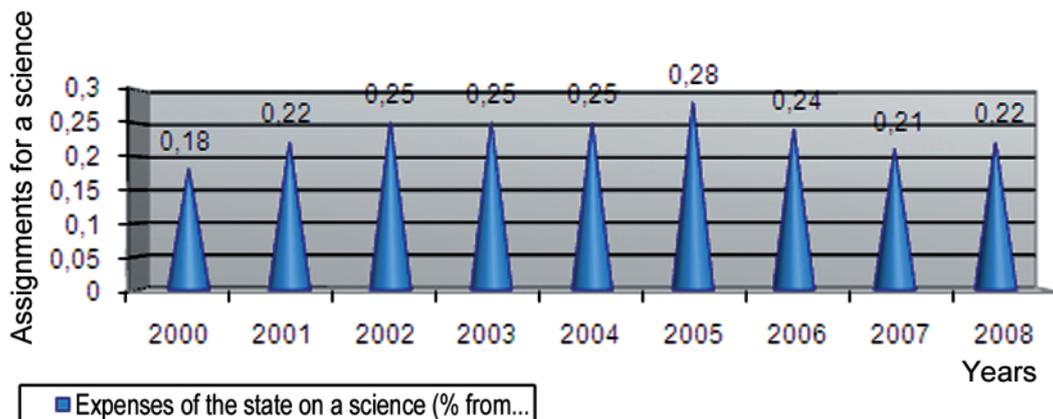
Other rather serious reason of low innovative receptivity, and consequently

the absence of technological advantages of domestic economy is the problem of financing of science in common in Kazakh-

stan, and fundamental, particularly. In RK the level of state financing of science has unstable dynamics (Fig. 3).



**Fig. 2.** Expenses for technological innovations of the enterprises for financing sources in 2003-2008 yy.



**Fig. 3.** Expenses on a science in 2000-2008 yy. in Kazakhstan (in % to GNP)

In comparison with the developed countries this showing has rather low level (USA – 2,9% from GDP, Japan – 3,0%, Germany – 2,35%, France – 2,25%, Sweden – 4,0%). For the stable development of country, by the calculations of international experts, it's necessary, that to the financing of science there were led from 2 till 4% GDP [8].

The level of education and science today is the visit card of state. In Kazakh-

stan on 01.01.2009 year from 16 304 workers, who carried out scientific researches and developments, near 80% has higher professional education (13036 men). But at the perspective the preservation of personnel potential of domestic science is predicted only in the quarter, and more than in the half of directions the personnel potential will weaken. It is apparently from the statistic facts, according to which, during the last 6 years (2003–2008 years) the

number of scientists in Kazakhstan, who carried out scientific research and developments, decreases by 274 men or 1,6%, the specific weight of doctors who are older than 60 years increased from 45,5% till 47,4%, that means the undeniable tendency of personnel aging.

Thereby, the problem of guaranteeing of technological advantages of Kazakhstan with the aim of dynamical development of economy is held back by many aspects, starting from innovative receptivity of country to the technological innovations, and finishing with the absence of conditions for the development of science and scientific potential of republic.

The president of the Kazakhstan N.A. Nazarbaev in his message in 2010 year to the nation of Kazakhstan noted, that «industrial development is our chance in new decade, new possibilities for development of the country» [9]. That's why the lead positions in the world there are occupied by those countries, which are not stopping to reinvest their income that was received from the introducing of new technologies, giving the additional acceleration to them.

### References

1. Kasimov S.M. Potential possibilities of diversification and technological modernization of economy of Kazakhstan // Herald of agricultural science of Kazakhstan. – 2006. – №3. – P. 17–23.
2. Espolov T.I., Kasimov S.M. Basic factors and conditions, which define the forming of industrially-innovative clusters at the agro-industrial production // Materials of MNPK «Perspectives of cluster development in the agrarian sector of Kazakhstan». – Almaty, 2006. – 1 Vol. – P. 10-15.
3. Kasimov S.M. Tendencies of technological development and modernization of sectoral structure of world economy in the XX century // Herald of agricultural science of Kazakhstan. – 2006. – №2. – P. 5–13.
4. Agency RK by statistics. About innovative activity of enterprises in the Kazakhstan Republic in 2007–2008 year. URL: <http://www.stat.kz>.
5. Theses of speech of Minister of economic development of Russian Federation E.S. Nabiullina at the Plenary meeting of First International Forum by Nanotechnologies, the 3<sup>rd</sup> of December 2008 year. – M.: CVK «Expocenter», 2008. URL: <http://www.economy.gov.ru>.
6. Tychinski A.V. The direction of innovative activity of companies: modern approaches, algorithms, experience. – Taganrog, 2006. – P. 16.
7. Kubaev K.E., Turginbaeva A.N., Sadyhanova G.A. The phenomenon of innovative receptivity of Kazakhstan enterprises // Herald of KazNU. Economical series. – 2008. – №6. – P. 85–89.
8. Turginbaeva A.N. Innovations and risks. Studying manual. – Almaty, 2008. – 117 p.
9. Nazarbaev N.A. New decade – new economical rise – new possibilities of Kazakhstan. Message of the President of RK to the people of Kazakhstan from 29 of January 2010. URL: <http://www.minplan.kz/message/467/28149>.

*Materials of Conferences***ESTIMATION OF INVESTMENT CLIMATE AT THE REGIONS OF THE FAR EAST**

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For the complex analysis of conditions of rational use of investments at the economic science and practice there is used scientific category of investment climate. Investment climate is a generalized characteristic of totality of social, economic, organizational, legal, political, sociocultural premises, which suppose attractiveness and reasonability of investing in one or another economic system (economy of the country, region, corporation).

The creation of favourable investment climate in Russia is one of the most important conditions of mobilization of investment and further economic growth of the country. Nowadays for the overcoming of recession, for the guaranteeing of stability and stable growth of Russian economy there are necessary stable investment aid. The activation of investment activity in the country directly depends on investment activity and investment attractiveness of its regions.

Nowadays on the basis of Conception of long-term socially-economical development of Russian Federation for the period till 2020 year «...state regional politics is directed to the guaranteeing of balanced socially-economical development of the subjects of Russian Federation, decrease of the level of inter-regional differentiation at the socially-economical condition of the regions and quality of life. Balanced territorial development of Russian Federation provides the directivity to the guaranteeing of the conditions, which allow every region to own necessary and sufficient resources for guaranteeing decent living conditions of citizens, complex development and increase of competitiveness of regional economy» [1].

For the characteristic of investment climate of region many Russian scientists as the base component single out such concept as investment activity and investment attractiveness, which includes investment potential and investment risk.

*Investment activity.* As analysis shows, in 2008 the volume of investment to the basic capital in RF was 8764864,1 million roubles (that is 30,5% more than in previous year), while this the distribution by the federal districts formed like that: the biggest density went to the Central federal district – 2152342,0 million roubles (25%), then follows Ural one – 1463299,3 million roubles (17%),

Volga – 1455069,7 million roubles (17%), Northwest – 998636,5 million roubles (12%), Southern – 905814,4 million roubles (11%), Siberian – 895248,0 million roubles (11%) and the most minimal number of investments go to the Far Eastern federal district – 564167,6 million roubles (7%).

Far Eastern federal district (FEFD) is the largest area of Russia's regions. The basic leading sectors are: mining – with the biggest «union» meaning of diamond's (Yakutia) and gold mining; fishing and fish cannery industry (Primorye, Kamchatka, Khabarovsk Territories, Sakhalin region); nonferrous metallurgy (Dalnegorsk); machinery industry – shipbuilding and ship repair (Vladivostok), including production of ship's diesel engines (Khabarovsk), production of heavy lifting and transport equipment (Komsomolsk-on-Amur); timber industry (Amursk) and other. At the same time this region is characterized by underutilization – especially by the coal mining and production of water power.

On the one hand these and other characteristics improve, and on the other hand worsen the investment activity and attractiveness of the FEFD regions and it directly affects the volume of investment to the basic capital. The volumes of investments by the subregions of FEFD are shown in a table 1.

The analysis of facts shows, that the biggest density in 2008 y. By the volume of investment to the basic capital goes to the Sakha Republic (Yakutia) – 27,3% and Sakhalin region – 26,7% then follow Khabarovsk territory – 13,7%, Primorye territory – 12,9% and Amur region – 11,5%, extremely minimal part goes to the Kamchatka territory – 2,8%, Magadan region – 2,1%, Chukotka autonomous district – 1,6% and Jewish autonomous region – 1,4%. The dynamics of growth rate of investments by the Far East and its subregions in general correspond to the All-Russian tendencies.

The activation of investment activity in some regions is connected:

- with the bulding and bringing into service of plants by producing liquefied natural gas (on the Sakhalin island within the bounds of the project Sakhalin-2);

- with the creation at the Far East of gas-transport system for the guaranteeing of necessities of region users in gas and gas export to the countries of Asia-Pacific region;

- with the building of infrastructure objects for the carrying out in 2012 y. summit of APEC in the city of Vladivostok.

Table 1

Volume of investments to the basic capital by the regions of FEFD (million roubles)

Region	2000 y.	2005 y.	2006 y.	2007 y.	2008 y.
FEFD	53589,0	276291,0	330824,7	436848,7	564167,6
Including					
Sakha Republic (Yakutia)	15809,0	48977,9	56618,8	119824,5	154187,9
Kamchatka territory	3546,0	7059,8	8336,9	13019,2	15913,3
Primorye territory	7332,0	28498,6	34233,5	46988,1	72749,1
Khabarovsk territory	11605,0	39166,1	47281,4	64543,8	77372,5
Amur region	4051,0	23742,5	28650,9	45683,2	64799,2
Magadan region	2138,0	5126,5	7109,3	9899,6	11980,4
Sakhalin region	8067,0	110850,3	137528,8	122756,2	150384,1
Jewish autonomous region	340,0	5460,8	6059,4	8540,7	7986,2
Chukotka autonomous district	701,0	7408,5	5005,7	5593,5	8794,9

Source: Done by the author by [2].

Analysing the motives of investment in other regions, we can say, that they were more combined to the side of short-term of current demand, which guarantees fast receiving of profit.

#### *Investing attractiveness*

The appearance in Russia (instead of one and only investor – state) of many independent business entity and potential investors, and also arrival to the Russian market of foreign investors caused the necessity in estimations of investment attractiveness of Russia's regions.

The analysis of economic literature showed that in practice there are used three most character approaches to the estimation of investment attractiveness of the region: narrow (other interpretation – narrowed, macroeconomic), factor (widen) and risk (factor-risk).

First approach – narrow (narrowed, macroeconomic). It is based on the revealing of some fundamental factor, characteristic, the presence of which definitely defines the investmet attractiveness of the region. Also this approach is based on the estimation of macroeconomic showings, such as: dynamics of gross domestic product and volume of production of industry products; dynamics of distribution of the national income, proportions of accumulation and consumptions; condition of legislative regulation of investment activity; development of separate investment markets, including stock and money.

The followers of first approach are such scientists as, for example, K. Guseva, the basic factor of investment attractiveness she considers «market reaction of regions» [3]. This indicator reflects the degree of adaptation of regions to the market relations. At the offered by her method of estimation of investment attractiveness of regions there are used such showings, while the analysis of which there rise the subjective factor, what is naturally cannot but affect the results of analysis. O.V. Inshakov lays an emphasis on the production [4]. I.U. Zulkarnaev considers «the institute of society» to be the decisive factor, which could be examined as institutional recourses of the region. T. Lukyanenko point out the necessity of forming of positive opinion of the investment objects. A. Stecenko and E. Beniksov denote such factor as «image of the region» [5]. These approach is the most simple, doesn't require considerable costs on its realization, because there are used simple methods and calculations. It is universal and can be used for the research of investment attractiveness of economic systems of different level. But on the base of narrow approach investor receive only the information about the effectiveness of investments and practically cannot reach based investment decision. The lack of information is conditioned by the absence in this approach the analysis of the factors of investment potential, investment risks, and also interconnections of elements, which compound the investment processes. In other words this approach

ignores the objective connections between factor of investments and other resource factors of development of RF subjects.

Second approach is factor (widen). It has a lot of interpretations in different methods. While this approach there are used qualitative and quantitative methods of estimation of different factors from the experts' estimation till the quantitative dependences and mathematical models. The essence of this approach consists in the definition of influence of different factors and their interconnections on the resultant estimation of investment attractiveness. It allows to single out enlarged groups of close by the essence showings, which are further considered as factors. The estimation of investment attractiveness in that case comes to the estimation of influence of such enlarged factors on the condition of investment environment. In spite of essential differences in the methods of estimation, let's single out the number of factors that are character for all scientific researches [6, 7]: politic, social, economic, ecological, criminal, financial, resource-based, labour, production, innovative, infrastructure, consumer, institutional, legislative.

The resultant showing of estimation of investment attractiveness while the factor approach there comes out the sum of many weight average estimations by the totality of researched showings with the taking into consideration of its meaningfulness. With the integral showing there is often given extra information about some factors, which influence the investment attractiveness. The factor approach give base for the reaching by the investor the decisions of investment and reflects the balance of interests of potential investors and recipients of investment resources.

The followers of this direction are A. Privalov, M. Knysh, B. Perekatov, U. Tutikov. In our opinion this approach has a lot of advantages. It allows to make conclusions about investment perspectives of Russian regions' development; allows to define the degree of realization of their investment attractiveness; allows to estimate the majority of showings with the statistic methods; gives an opportunity of substantiation of trustworthiness of the received results – use of criterion of degree of narrowness of correlative connection between considered categories. But, in our opinion, there exist definite shortcomings, the main of which is the «opacity» of method of revealing of factorial signs of investment attractiveness.

Third approach – risk (factor-risk). It supposes the use of similar to factor approach methods of estimation, but the base aim of this approach consists in definition of level of risk of investments to the economic system. The base of risk approach is

the estimation of investment potential as definition of essential conditions of carrying out of investment activity and investment risk as the probability of investment loss. The methods of estimation, which were developed within risk approach, have rather big informativity, because they examine a lot of factors and characterize the peculiarities of investment processes in terms of risk. The defined likeness of researched factors and used methods at the risk and factor approaches singled out as the base of integration in some methods.

The followers of third approach (G. Marchenko, O. Machulskaya and others) analyse the big number of factors, but investment attractiveness of the region in this case is considered as aggregative indicator, which is defined by two characteristics: investment potential and investment risk [8].

The analysis of special literature showed that on the base of this approach there are formed several popular methods. In the Russian practice there is widely use a method of making of complex rating of investment attractiveness of Russian regions, which was developed by the analytics of rating agency «Expert-RA». The key element of this method is the use of two components of investment attractiveness: investment potential and investment risk [9].

Investment potential takes into consideration base macroeconomic characteristics: territory's richness with the factors of production (natural resources, labour force, fixed assets, infrastructure etc), consumer demand and other. Total investment potential of region consists of nine particular potentials (till 2005 y. – of eight): naturally-resource; labour; production; innovative; institutional; infrastructural; financial; consumer; tourist.

It should be noted that above mentioned showings of investment potential in turn are aggregated estimations and are characterized by the whole group of internal indicators.

The investment potential of the regions of Far Eastern federal district for 2007–2008 yy. By the estimation of the «Expert-RA» id showed in the table 2.

The analysis of investment potential of FEFD regions shows that eight regions have relatively high naturally-source rank (except Jewish autonomous region), what is on the one hand should attract the investor. But, for the Sakha Republic (Yakutia), Primorye and Khabarovsk territories is character very low infrastructure rank; for the Sakhalin, Magadan and Jewish autonomous regions – labour; for the Chukotka autonomous district – consumer; for the Kamchatka territory – labour and consumer; for the Amur region – innovative. Narrow oriented to the extractive industry

investor doesn't want to invest money into the infrastructure, and the attempts to force to do it lead to his leaving the region. Foreign experts appreciate the presence of infrastructure: transport and geographic position of territory they single out to the first place by the meaningfulness among other factors of investment attractiveness, and resource potential – to the last. National experts establish the priorities in different way: at the first place is

the production potential, and on the second – resource. Thereby, from the positions of national researchers the most important thing for business is to have resources and money. While for the foreign entrepreneurs is the possibility of their comfortable «reaching». If it's not possible to reach the resources, there become first-priority the projects by the creation and development of necessary infrastructure, when it is economically justified.

Table 2

Investment potential of FEFD regions in 2007–2008 yy.

Rank of potential		Rank of risk, 2007–2008 yy.	Region	Ranks of the parts of investment potential in 2007–2008 yy.									Change of the potential rank, 2007–2008 yy. to 2006–2007 yy.
2007–2008 yy.	2006–2007 yy.			Labour	Consumer	Production	Financial	Institutional	Innovative	Infrastructure	Naturally-resource	Tourist	
19	18	57	Sakha Republic (Yakutia)	43	46	41	35	58	44	83	2	70	-1
21	22	64	Primorye territory	18	26	37	24	19	22	44	17	21	1
28	25	51	Khabarovsk territory	27	30	36	26	34	40	60	8	42	-3
53	64	69	Sakhalin region	71	59	34	41	55	65	54	20	73	11
56	48	61	Amur region	63	62	64	59	64	69	66	13	65	-8
67	74	80	Kamchatka territory	73	73	71	67	71	56	67	16	54	7
70	69	76	Chukotka autonomous district	82	84	79	82	82	82	72	9	84	-1
73	71	83	Magadan region	80	75	75	75	74	70	77	15	79	-2
80	78	75	Jewish autonomous region	81	78	78	79	75	77	62	41	81	-2

Second indicator – investment risk – reflects the probability of investment loss and income from them. Risk is probabilistic, qualitative characteristic. Per unit there is taken The Russian average level of risk. The calculation of the risk is carrying out similarly to the calculation of investment potential. With regard to the region we can single out following types of risk: economic; financial; social; ecological; criminal; legislative; administrative.

Investment risk of regions of Far East federal district for 2007–2008 yy. By the estimation of «Expert-RA» is showed in the table 3.

Thereby on the 1 of January 2008 y. to the regions of FEFD in the whole plan there were given following categories of investment climate: Sakha Republic (Yakutia) (77) – average potential – moderate risk (2B); Kamchatka territory (78) – insignificant potential – high risk (3C2); Primorye territory (79) – low potential – moderate risk (3B1); Amur region (81) – insignificant potential – moderate risk (3B2); Magadan region (82) – low potential – extremal risk (3D); Sakhalin region (83) – insignificant potential – high risk (3C2); Jewish autonomous region (84) – insignificant potential – high risk (3C2); Chukotka autonomous district (85) – insignificant potential – high risk (3C2).

Table 3

Investment risk in the regions of FEFD in 2007–2008 yy.

Rank of risk		Rank of potential, 2007-2008 yy.	Region	Ranks of components of investment risk in 2007-2008 yy.							Changing of risk rank 2007-2008 yy. to 2006-2007 yy.
2007–2008 yy.	2006 –2007 yy.			Legislative	Social	Economic	Financial	Criminal	Ecological	Administrative	
51	35	28	Khabarovsk territory	4	52	67	50	72	62	25	-16
57	54	19	Sakha Republic (Yakutia)	48	39	77	55	17	71	55	-3
61	57	56	Amur region	31	47	70	65	54	61	70	-4
64	52	21	Primorye territory	53	50	33	56	71	68	66	-12
69	70	53	Sakhalin region	60	76	25	60	36	59	4	1
75	76	80	Jewish autonomous region	27	65	80	78	66	34	65	1
76	77	70	Chukotka autonomous district	62	70	79	72	33	77	74	1
80	83	67	Kamchatka territory	49	82	83	76	46	49	77	3
83	80	73	Magadan region	33	85	84	79	70	69	73	-3

Thereby, for the regions of FEFD there is character internal limitation of growth, which is conditioned by insufficient development of transport and energetic infrastructure, deficit of qualified engineering and labour personnel. Modern situation is strengthened by the pendency of the number of social and institutional problems, the most important of which are: high level of social inequality and regional differentiation; high risks of carrying out of entrepreneurial activity in Russia, in connection with the presence of corruption, excessive administrative barrier, insufficient level of protection of property rights; weak development of the forms of self-organization and self-regulation of business and society, low level of competition at the markets, which doesn't create for enterprises the stimulus to the rise of productivity of labour; insufficient level of development of national innovative system, coordination of education, science and business.

But, territories of FEFD, in the nearest future should interest the investors, because modern state politics is directed to the active development of Far East, which is in considerable measure based on the huge natural resources (fish, timber, coal, oil and gas, ore and mineral), and also profitable seaside geographical position and nearness to the markets of the countries of Asian-Pacific region. The most important region, which regu-

lates the development of the Far East regions in the medium-term perspective, is the realization of federal target program «Economic and social development of Far East and Transbaikalia for the period till 2003 year» and preparation to the summit of APEC.

The principle factor of development of FEFD regions is the solving in the long-term of problems of gasification, forming of distributed power system, optimization of transport and energetic tariffs, modernization and creation of new seaports, also for the development of container transportation and export of resources, creation of the common connection system of transport communication, which connects basic centers of Far East, and also their integration into the All-Russian and world transport systems.

#### References

1. The conception of socially-economical development of Russian Federation for the period till 2020 year. Affirmed with the order of Government of Russian Federation 17 of November 2008. – №1662.
2. <http://www.gks.ru>.
3. Guseva K. Rating of the subjects of Russian Federation by the degree of fairness of investment climate. // *Economical questions*. – 1996. – №6. – P. 90-99.

4. Inshakov O.V. Theory of factors of production at the context of development: scientific address at the presidium of IASS (Moscow, 29 of November 2002). – Volgograd: Publishing house VOLGU, 2002. – 92 p.

5. Stecenko A., Beniksov E. Disclosure of information and maintenance of investment image // Market of valuable paperworks. – 1999. – №5 (140). – P. 88-92.

6. Pshikanokova N.I. Regional investment politics: institutional-economical mechanism of strategic direction // Herald ASU. – 2005. – №4(19). – P. 33–61.

7. Suhinova S.E. Regional specific of investment climate / S.E. Suhinova. – Volgograd: Publishing house VolGU, 2004. – 82 p.

8. Marchenko G., Machulskaya O. The research of investment climate of Russian regions // Economical questions. – 1999. – №9. – P. 69–79.

9. <http://www.raexpert.ru>

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*Materials of Conferences***IMMUNOPATHOLOGY  
OF THE PROFESSIONAL  
NEUROINTOXICATIONS**

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A significant number of chemical enterprises is situated within the territory of the Eastern Siberia, thousands of people that work there are the prior risk group since they are exposed to unfavourable production, social-ecological, economic, and other factors. So the total impact on their organisms is considerably higher. Numerous clinic-immunology inspections of people that work in contact with different neurotoxins (organic mercury, epihlorohydrin, vinyl chloride) allowed us to reveal a significant variation of the negative effects: from initial donosological alterations to clinically-expressed professional diseases.

In that case the exposure of the alterations peculiarities of the immunological indexes of workers that are induced by the exposure of production neurotoxins of different chemical nature turns to be quite urgent. A clinical immunological inspection of 133 male workers of the enterprise «Sayanchimplast» that are exposed to mercury impact, 185 men that are exposed to the impact of vinyl chloride, and 198 men that are involved into the production of epihlorohydrin «Usolechimprom». The comparison group consisted of 193 workers that do not interfere with unfavourable production factors.

Differently directed alterations of the immunological indexes of almost healthy people testify the different level of the adaptive mechanisms under different production risks exposure. The impact of the production factors inevitably induces the compensatory processes chain. The initial activation of the immunopathology cells can lead to various ends depending on a number of inner and outer factors (specificity, intensity, the duration of the unfavourable factor impact, genetical predisposition and other). Favourable conditions cause the condition of physiological adaptation. However, the durable impact of the unfavourable inner and outer factors upon workers provides for the development of secondary immune-deficient and autoimmune conditions. In that case the problem of the workers' organism resistance level definition becomes quite important, especially at that stage,

when the revealed alterations haven't lead to the professional pathologies development and are reversible.

It has been found that those that with the development of the immunopathology process of persons with a professional pathology (chronic mercury intoxication, toxic enciphalopaty) the decrease in the lymphocyte content that express CD3, CD4, CD8, CD16 on their surface and the growth of early(CD25) and later (CD95, HLA-DR) phases of lymphocyte activation markers in periphery blood. Workers that have more than 10 years of service under the impact of neurotoxins and do not have any pathological alterations also experience the increase (though less expressed in comparison with those who have professional pathologies) in lymphocytes that carry CD95 and HLA-DR. It is possible that the increase in density on their lymphocytes makes condition on the anomalous high perceptibility of immune system of workers to the antigens of their own tissue and the production environment. The results of our research showed that the autoimmune processes are involved into the development of the professional damages of nervous system. A weak increase in auto-antibodies to brain-specific proteins (BSP) of those that work under the conditions of mercury impact and chloride carbohydrates without any professional pathologies is conditioned by poli-clonal activation of cellular immune system elements and can be considered as a physiological protective mechanism. And only the high level and the high frequency of the self-sensitization testify their pathogenetical role. For example, as we said earlier about the fire liquidators with toxic encephalopathy in far, post-contact period (high levels of anti-bodies to BSP were found with 93,7%, to DNA – with 81,03% of the examined workers). In a number of cases with the staging of process the collection of a definite level of antibodies can be replaced by their complete sorption in tissue. We propose to testify our theory of an important role of autoimmune mechanism in the separate professional damages of nervous system and define the most significant humoral and cellular factors in the development of local and system autoimmune response, and to base their diagnosis and practical value in a number of present experimental and clinic researches. Thus, considering that the condition of the immune system is one of the defining factors of the professional neurointoxication development, the search for new methods of the selective immune-rehabilitation of the worker's immune disturbances becomes very

important. The knowledge of the immune system alteration dynamic legislations increases the effectiveness of the workers' health condition evaluation and prognosis.

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**THE TEENAGERS' CYTOGENETIC HOMEOSTASIS PECULIARITIES AND SPECIAL FEATURES UNDER THE ECOLOGICAL ENVIRONMENT PRESENT – DAY CONDITIONS**

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It is quite known, that the genetic homeostasis disorders symptoms, such as the micronuclei and the other nuclear anomalies, having revealed by the micro-nuclear test, are the

non-specific human organism reaction upon the various and the diverse (e.g. toxic, ecological and stress) influences. The cytogenetic homeostasis evaluation has been carried out at the 118 lyceum pupils at the age of the 13–15 years, having learned at the «Classical» №1 lyceum MOU in the Rostov-on-Don town.

The buccal epithelium cells research by means of the micro-nuclear test (e.g. Zhuleva and et. al., 1996) has been discovered some quantity nuclei with the nuclear disorders presence at all the examined and the tested ones: by the micro-nuclei, by the invaginations, by the «tails», by the double nuclei, by the constrictions. Thus, the lyceum pupils' cytogenetic homeostasis research results have already been presented in the Table 1.

The nuclear disorders relative quantity has been varied from 1 % up to 27 %, having made up in average  $6,907 \pm 0,404$ . The invaginations and the constrictions quantity from them has been varied in the ranges from 0 up to 8 %, having made up in average  $1,746 \pm 0,152$  and  $0,983 \pm 0,123$  correspondingly, the double nuclei quantity – from 0 up to 6 % (e.g.  $1,364 \pm 0,127$ ), the micro-nuclei – from 0 up to 9 % (e.g.  $0,881 \pm 0,133$ ) and the «tailing» nuclei – from 0 up to 13 % (e.g.  $1,932 \pm 0,180$ ).

**Table 1**

The Nuclear Disorders Relative Quantity in the Lyceum Pupils' Buccal Epithelium Cells (%)

	<i>N</i>	<i>M ± m</i>	Minimum	Maximum
The nuclear disorders	118	$6,907 \pm 0,404$	1	27
The constrictions	118	$0,983 \pm 0,123$	0	8
The invaginations	118	$1,746 \pm 0,152$	0	8
The double nuclei	118	$1,364 \pm 0,127$	0	6
The micro-nuclei	118	$0,881 \pm 0,133$	0	9
The «tailing» nuclei	118	$1,932 \pm 0,180$	0	13

The «tailing» nuclei (e.g. 28%) have been prevailed at the examined and the tested lyceum pupils', the invaginations (e.g. 25%), the double nuclei have been made up 20%, the constrictions – 14%, the micro-nuclei – 13%.

Thus, it is quite evidently, that the nuclear disorders maximum quantity have been made up the invaginations and the «tailing» nuclei.

So, the correlation analysis has been carried out by us for the purpose of the possible connections revealing among the lyceum pupils' psycho-physiological characteristics and the

cytogenetic homeostasis level by means of the Spearman correlation rank coefficient. The final and the obtained results have been presented in the Tables 2 and 3.

As it can be seen from the Tables, the correlation analysis has already been revealed the reliable moderate positive connection presence between the school anxiety level and the buccal epithelial cells relative number with the micro-nuclei. So, the connections between the FMA profile characteristics and the cytogenetic homeostasis indices have not already been discovered.

Table 2

The School Anxiety Level and the Lyceum Pupils' Cytogenetic Homeostasis Indices Correlation

	<i>N</i>	<i>R</i> (Spearman)	<i>t</i> ( <i>N</i> - 2)	<i>p</i>
The constrictions & the school anxiety	65	-0,258633	-2,12514	0,037503
The invaginations & the school anxiety	65	-0,067785	-0,53926	0,591606
The double nuclei & the school anxiety	65	0,051745	0,41127	0,682273
The micro-nuclei & the school anxiety	65	0,291288	2,41683	0,018564
The «tailing» nuclei & the school anxiety	65	-0,098354	-0,78447	0,435706
The nuclear disorders & the school anxiety	65	-0,029021	-0,23044	0,818496

Table 3

The FMA Profile and the Cytogenetic Homeostasis Indices Correlation

	<i>N</i>	<i>R</i> (Spearman)	<i>t</i> ( <i>N</i> - 2)	<i>p</i>
The constrictions & FMA	104	0,090375	0,916492	0,361571
The invaginations & FMA	104	0,025098	0,253561	0,800345
The double nuclei & FMA	104	-0,064601	-0,653803	0,514710
The micro-nuclei & FMA	104	-0,082854	-0,839674	0,403055
The «tailing» nuclei & FMA	104	-0,048351	-0,488895	0,625966
The nuclear disorders & FMA	104	-0,021028	-0,212424	0,832200

As the formation, that is the micro-nuclei in the cells are being associated with the chromosomal or even the genomic disorders (e.g. Schmid W., 1975; Novitzky V.V. and et al., 1995), then the similar connection revealing between the cytogenetic indices and the school anxiety level is being indicated upon the development and the measures application necessary, having directed at the lyceum pupils' way of the life and the activity optimization, in particular – having differed from the others by the school anxiety high level, cytogenetic homeostasis of which is, apparently, the most vulnerable one.

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**THE PECULIARITIES  
OF MEDICAMENTAL MANAGEMENT  
OF THE PATIENTS OF ELDERLY AGE  
WITH COMBINED  
CARDIORESPIRATORY PATHOLOGY**

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The chronic obstructive illness of lungs (COIL), as the rule, develops of the persons older than 45 years, is slowly progressing, heavy and extremely heavy duration of illness falls on the age of 55-56 years. For this age population there is characteristic the polymorbidity and usually COIL is not the only one disease of the elderly man. The most often in the older age groups COIL is taking at the background of coronary artery disease, heart

failure, the abnormalities of the rhythm, hypertonic disease, diabetes mellitus, thrombophlebitis etc.

Accordingly, except the therapy by the COIL, these patients receive coronary active agents, hypotensive, diuretic and antiarrhythmic preparations, heart glycosides. The considerable part of elderly people takes sedative and hypnotic preparations. Bronchodilators occupy the central place in the symptomatic therapy COIL, all categories of bronchodilators raise tolerance to the physical load, even while the absence of changes of the volume of forced exhalation in 1 second (VFE1). With the taking into consideration of this fact, that elderly patients have multiorgan pathology, tachycardia, hypoxemia, the lowering with the age sensitivity of receptors to sympathomimetics, while the curing of this group of patients there raises the role of anticholinergic preparations. Ipratropium bromide is prescribed as the monotherapy, and in comparison with  $\beta_2$  – agonists. More revealed and fast subjective improvement is reached while the use of unbulized solution Bedural (fixed combination of fenoterol and ipratropium bromide). While the combination of inhalation bronchodilation tools there occurs the improvement of bronchial patency in the more degree, then while the prescription of any of these preparations as monotherapy. The rather comfortable and less expensive are fixed combinations of preparations in one inhaler. The combination of bronchodilators with different mechanisms of action raise the effectiveness and lowers the risks of side effects in comparison with the raising of the doze of one preparation. One of these preparations is berodual. The frequency of side effects while the use of berodual is lower than while use of sympathomimetics, so it can be used while the accompanying cardiovascular diseases of the persons of elderly and senile age. It's considered that the optimal inhalation technique of delivery of preparation while the intensification of COIL is dozed, aerosol inhalers in the combination with spacers or nebulizers. For people of elderly age, with regard to disfunction of respiratory muscular system, mental abnormalities, gravity of the condition there is preferably to use nebulizers. In connection with that patients of older groups can't make adequate inhalation maneuver, it impedes the use by them of dozed aerosol inhalers. Besides, the use of nebulizers doesn't require the cooperation of patient and constant control from the side of medical personnel of observance of the rules of inhalation.

The aim of our research is to assess the effectiveness and safety of nebulizing therapy with berodual of the elderly people with COIL in combination with coronary disease of heart and artery

hypertension. We observed 37 sick people with COIL with the middle-heavy, heavy and extremely-heavy duration at the age from 59 till 75 years at the period of intensification. COIL of these patients was combined with stenocardia of loading FK P-H and Hypertonic disease of P and H stages. With taking into account that at the phase of intensification patients with COIL require intensive bronchodilator therapy with an adequate way of delivery of bronchodilators, patients was treated with the therapy of inhalation berodual through the nebulizer «Delphinus F1000» (Itali). The assessment of effectiveness of curing was carried out by the facts of clinically-functioned research, which included spirometry, peak flow, ECG, there was assessed the frequency of heart beat, frequency of respiratory movements, arterial pressure, quality of sleep, tolerance to the physical load, satiety of blood with oxygen ( $\text{SaO}_2$ ) before and after inhalation course. The course of curing continued in average 18 days, with 2-3 inhalations a day through 6-8 hours. At the background of curing all patients have decreased the evidence of short breath, the number of dry wheezes in lungs, there was observed the trustworthiness increase of showings of bronchial patency (speed of space of exhalation increases in average to 32%, VGE1 – to 9%), there increased the tolerance to the physical load, there normalized the sleep,  $\text{SaO}_2$  increases in average to 3-5%. Meanwhile there was noticed good portability of berodual, there were no considerable changes of ECG and abnormalities of heart rhythm revealed. Patients at the background of decrease of anoxemia have the decreased figures of frequency of heart beat and frequency of breath moving without rising of arterial pressure.

Thereby, the curing with inhalation berodual with the help of nebulizer is the high effective, safe method and guarantees the stabilization of condition of the sick people with COIL, without appearance of cardiotoxic effect. With the taking into consideration that patients of elderly ages COIL is often combined with coronary disease of heart and hypertonic disease, weakening of respiratory muscular system and mental abnormalities, nebulizer therapy of combined bronchodilators (including berodual) is the most adequate and effective way of bronchodilation therapy in conditions of hospital.

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**THE PROCESSES OF LIPID  
PEROXIDATION WITHIN  
THE PATIENTS WITH CHRONIC  
OBSTRUCTIVE LUNG DISEASE**

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According to modern concept, the pathophysiological base of progressive obstruction of airways is a chronicle inflammatory process in lungs, when in answer to the action of destructive factors of external environment there is breaking the balance between the activeness of pro- and antioxidant, proteoclastic and antiproteoclastic processes [5, 6, 7].

The aim of our research is studying of the level of products of lipid peroxidation and activeness of ferments of antioxidant protection (AOP) in the blood plasma and condensate of breathed out air within patients with COLD of different degree of severity at the phase of intensification, as supplementary diagnostic criterions of course of inflammatory process.

**Materials and methods**

In all there were examined 55 men, who suffered from COLD of average and severe degree of severity, the average age of which was  $56,7 \pm 4,6$  years. The criteria of selection to the group of researched patients with COLD were the presence within them of volume of forced exhalation in 1 second ( $VFE_1$ ) < 80%,  $VFE_1$ /Maximal Expiratory Flow Volume < 70%, lasting experience of smoking more than 20 years, at the average –  $34,4 \pm 1,8$  years. The criteria of exception were: bronchial asthma, accompanying diseases at the stage of decompensation. From the whole number of patients in the I group there were included 28 patients with COLD of average degree of severity, the average age of which was  $52,6 \pm 2,8$  years, experience of smoking –  $29,2 \pm 5,1$  years, The index of smoking person (IS) –  $200,4 \pm 46,8$ , period of disease –  $14,7 \pm 2,5$  years, volume of forced exhalation in 1 second ( $VFE_1$ ) was –  $56,9 \pm 3,9\%$ , maximal expiratory flow volume (MEFV) –  $87,7 \pm 3,4\%$ ,  $VFE_1$ /MEFV –  $64,9 \pm 4,9$ , maximal speed of Exhalation (MSE) –  $357,8 \pm 23,4$  ml, average pressure in the lung arteries (APLA) –  $27,4 \pm 1,2$  mm of mercury, carbonation of oxygen ( $SaO_2$ ) –  $95,5 \pm 0,31\%$ . Into the II group there were included 27 patients with COLD of severe degree of severity, the average age of which was  $59,8 \pm 1,7$  years, experience of smoking –

$38,6 \pm 4,2$  years, IS –  $334,4 \pm 24,6$ , period of disease –  $19,4 \pm 1,1$  years,  $VFE_1$  –  $31,1 \pm 3,6\%$ , MEFV –  $45,8 \pm 4,7\%$ ,  $VFE_1$ /MEFV –  $67,9 \pm 6,4$ , MSE –  $181,4 \pm 13,68$  ml, APLA –  $38,3 \pm 3,1$  mm of mercury,  $SaO_2$  –  $89,6 \pm 1,18\%$ . The control group was made out of 27 practically healthy men of corresponding age.

The biochemical methods of research included definition in the blood plasma and CBA of initial products of lipid peroxidation – diene conjugates (DC), second – ketodienes (KD) and joint trienes (JT) by the method of Volchegorskiy and others [4], malondialdehyde (TBA – reactive product) by the method of Karpishenko A.I. [7], and also final products of lipid peroxidation – Schiff basis (SB) by the method of Volchegorskiy I.A. and others [4]. The level of activeness of lipid peroxidation and peroxydase of plasma was estimated by the methods of Terekhina N.A. and Petrovich U.A. [6], catalase – by the methods of Koroluk M.A. and others [8]. The statistic treatment of material was carried out with the help of standard methods of variative statistic of medico-biological profile with the help of computer program «Statist».

**Results and discussion.**

Within examined patients with COLD of average and severe degree of severity at the phase of intensification there were observed abnormalities at the system of lipid peroxydation – antioxidant protection, which was characterized by the presence of system oxidative stress, which is expressed by the considerable hyperproduction of free radical metabolites and increase of second and final products of lipid peroxidation.

Free radical oxidation has one of the key role at the molecular mechanisms of pathogenesis of COLD [2, 3, 5, 6]. From this < there was carried out the comparative analysis of content of products of lipid peroxidation in the plasma and CBA within patients with COLD of I and II groups. While the analysis of average values of concentration of products of lipid peroxidation in the blood plasma and CBA within patients with COLD of I and II groups at the phase of intensification there was observed statistically meaningful increase ( $p < 0,05$ ) KD, JT, SO and TBA of products in comparison with control. With the increase of degree of severity of disease the intensiveness of processes of lipid peroxidation in the researched spheres increased. It was revealed, that within patients with COLD of severe degree at the phase of intensiveness the content of final products of lipid peroxidation (SB) at the blood plasma and CBA is considerably higher ( $p < 0,05$ ) in comparison with patients with COLD of average degree of severity.

Within researched patients there was studied the activeness of ferments of antioxidant protection (MSE, catalase, peroxidase) at the blood plasma and CBA. The analysis of average values of activeness of researched ferments showed, that within patients with COLD Of I and II group there occurs exhaustion of antioxidant protection in comparison with control, mainly at the late stages of disease. Within patients of II group at the blood plasma the activeness of peroxidase was decreased in comparison with patients of I group ( $p < 0,05$ ).

Carried out researches confirm the increasing number of proves, that while the COLD there occurs disbalance at the system of oxidants-antioxidants to the side of oxidants [2, 3, 6]. Within observed patients with COLD of average and severe degree of severity at the stage of intensiveness the markers of oxidative stress were found at the blood plasma and condensate of breathed out air.

### Conclusions

1. Chronic obstructive lung disease at the phase of intensification is characterized by the strengthening of peroxidation of lipids and depression of fermentative link of antioxidant protection in the blood plasma and condensate of breathed out air, which are progressing by the measure of increase of the severity of disease.

2. The change of the level of products of lipid peroxidation and activeness of ferments of antioxidant protection in the condensate of breathed out air within patients with COLD at the phase of intensification allows to use this non invasive method for the estimation of condition of system oxidants-antioxidants within this group of patients.

### References

1. Avdeev S.N. Cronicle obstructive disease of lungs as a systemic disease / S.N. Avdeev // *Pulmonology*. – 2007. – №7. – P. 104–116.
2. Anaev E.H. Research of condensate of breathed out air in pulmonology (review of foreign literature) / E.H. Anaev, A.G. Chuchalin // *Pulmonology*. – 2002. – №2. – P. 57–64.
3. Berezuk, L.V. The research of changes of lipid peroxidation within patients with COLD // *Collection of works of the IV congress of pulmonologists of Ural federal district*. – Chelyabinsk, 2004. – P. 6–8.
4. Volchegorskiy I.A. Comparison of different approaches to the definition of products of lipid peroxidation in a heptane-isopropanol extracts of blood / I.A. Volchegorskiy, A.G. Nalimov, B.G. Yarovinskiy, R.I. Livshic // *Questions of medical chemistry*. – 1989. – №1. – P. 127–130.
5. Global Initiative for Chronic Obstructive Lung Disease (GOLD) // National Heart, Lung, and Blood Institute. – Publication № 2701, April 2001.
6. Global Initiative for Chronic Obstructive Lung Disease (GOLD). Global strategy for diagnosis, management, and prevention of chronic obstructive pulmonare disease. NHLBI/WHO workshop report. Last updated 2006.
7. Karpishenko A.I. Medical laboratory technologies / A.I. Karpishenko. – St. Petersburg, 1999. – P. 618–647.
8. Koroluk M.A. The method of definition of the activeness of catalase / M.A. Koroluk, L.I. Ivanova, I.G. Maiorova // *Laboratorial work*. – 1988. – №1. – P. 16–19.

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### NEW DIRECTION IN TREATMENT OF A DIABETES 2 TYPES

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One of unknown factors in pathogenesis of type II diabetes are insufficiency of adsorption-transport function of erythrocytes. Therefore complex therapy of diabetes 2 types should include actions and medications improving this function of erythrocytes.

Erythrocytes adsorb different substances on its surface. Proportion of adsorbed substances differs, from corresponded indexes of plasma. Erythrocytes easily flow through tighter, than erythrocytes diameter, arterial part of capillaries. Erythrocytes deformation and rotation promote this process. On my hypothesis has been arisen that during passage of each erythrocyte via blood capillaries to exist exchange and mix substances of paraendotelial exchange layer on molecules adsorbed on erythrocytes [1, 2]. After that these substances firstly participate in transcapillary exchange.

Erythrocytes are natural sorbents of substances with high chemical activity. At the same time during denaturation process proteins' adsorbing ability increases. Proteins and lipids with increased adsorbability partially displace glucose

from erythrocytes' surface. Owing to those peculiarities many «dedicated to deletion» substances firstly enter to liver. Glucose has relatively high adsorbability on erythrocytes surface. In particular conditions glucose partially pushes out native proteins and many lipids from erythrocytes' surface. That is why quantity of transported glucose under effect of hormones can sharply increase or decrease.

This and other fact may be explained by absorption- transport function of erythrocytes (ATFE). ATFE participates in creation of new antiedematous (contradictory) factor. Part of adsorbed glucose always goes to tissues. On the place of departed glucose mostly proteins are adsorbed on erythrocytes surface. Correspondingly protein concentration in parietal layer of venous part of capillaries decreases and concentration gradient of protein change. Correspondingly increase protein return from interstitium to blood. This mechanism is strengthened by known erythrocytes' volume increase (and correspondingly adsorption area) at their saturation by carbon dioxide. At the type II diabetes this antiedematous mechanism decreased.

In our experiments on narcotized animals under insulin effect a quantity of glucose sharply decreased firstly among substances, adsorbed on erythrocytes, then in plasma, lastly its content slowly decreased in lymph. Opposite example – multi increase of glucose quantity adsorbed on erythrocytes surface at astronaut's blood on landing day (in plasma glucose quantity increased to the upper level of norm). Adrenalin simultaneously increases content of adsorbed and plasmas glucose [3].

Part of erythrocytes adsorbed glucose always enters to tissues, including regulatory structures. In my opinion it starts insulin mechanism of carbohydrate metabolism regulation. Chronic stresses with frequent ingestion, metabolism problems always supported by increased transport of glucose on erythrocytes surface. At the same time glucose inflow inside the erythrocytes also strengthens. Increased above the norm endoglobular glucose content leads to its connection with hemoglobin.

As much as percentage of glycated hemoglobin increases, erythrocytes' ability to adsorb on its surface glucose and other substances decreases. Relative decrease of glucose transport on erythrocytes, in my opinion, distracts adequate regulation of carbonhydrates exchange.

Probably, it is broken also transport of insulin on erythrocytes surface. It, possibly, is an additional reason of insulin «tolerance» development. Gradually more glucose is transported in plasma – all known symptoms of type II diabetes are getting

stronger. Generally, insufficiency of adsorption-transport function of erythrocytes complicates pathogenesis of type II diabetes.

From the above mentioned it is clear that type II diabetes therapy should include impacts and medicine that improve ATFE. Connection of glucose with hemoglobin and glucose with proteins is very strong. Therefore one of methods of first help is replacement of a donors erythrocytes with increased content of active hemoglobin. Positive effect on type II diabetes is noticed after replacement of part of blood plasma by salt solution [4]. Possibly its connected either to deletion of glycat-ed plasma proteins, or by erythrocytes «washing» with ATFE improvement.

Preparation ASD-2 (Antiseptic stimulator Dorogow, fraction 2 – liquid with a specific smell) on our data, promoted «rejuvenation» to blood and also decrease of glucose in blood. Begin to start to accept a «Preparation ASD-2» it is necessary from the lowest doze. The higher dosage of a medicine can cause visible erythrolysis. Positive action of this medicine, in our opinion, first of all is connected with erythrogenesis and leukopoiesis stimulation. Studying ATFE in clinic, and also influences drugs on this function only begins. Ways of optimization of adsorption-transport function of erythrocytes are not clear. It is possible to assume, that among the effective therapeutic means advertised as cleaners from «slags» (waste-metabolism products), there are the preparations operating first of all on this function.

At insulin-dependent diabetes (type I diabetes) always appears the initial form of a diabetes 2 types develops. Therefore at treatment a diabetes I types it is necessary to consider all the above-stated new opportunities of therapy of a type II diabetes.

In connection to continuous growth of people suffering from type II diabetes, on 20 December 2006, UN General Assembly accepted resolution, according to which diabetes brings the same threat to humanity as infectious epidemics. Possibly insufficiency of ATFE is the last factor which is unknown at type II diabetes pathogenesis. Actions for elimination of this problem will let to stop «epidemic» growth of people suffering from this disease.

In the given publication it would be desirable to emphasize necessity of revealing and creation of new preparations for treatment of a type II diabetes with simultaneous therapy of insufficiency of adsorption-transport function of erythrocytes. On elimination of this insufficiency, on creation and search of more effective preparations, undoubtedly, it is possible to accelerate our researches at

cooperation. With offers on scientific and other cooperation to address by e-mail – e-mail (tatrauf@mail.ru <mailto: tatrauf@mail.ru> a theme of the letter – a science). Wide check of efficiency of methods of treatment developed by us demands the certain financing. For financial support of these our works on studying and therapy of a type II diabetes and a metabolic syndrome the open account. Number of the account (Kazakhstan) KAZKOM VISA 4003 0327 0712 1630 RAUF GAREYEV .

#### References

1. Gareyev R. Transcapillary exchange and lymphformation. – Almaty: Science, 1989. – 142 p.
2. Gareyev R. Concept of adsorption-transport function of erythrocytes // Materials of 5<sup>th</sup> Kazakhstani physiologist's congress. – Karaganda, 2003. – P. 75–79.
3. Gareyev R. Medicobiological studies, connected to Kazakhstan cosmonauts flights //Space research in Kazakhstan. – Edit. – Sultangazin U, 2002. – P. 446 – 460.
4. Postnikov A.A. Medical practice of blood purified. – M.: Applied medicine, 2008. – 222 p.

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#### COMPARATIVE CHARACTERISTICS OF WOUND PROCESS IN PATIENTS WITH PURULO-NECROTIC FORMS OF DIABETIC FOOT SYNDROME

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Learning peculiarities of wound process is one of the main directions in solving a problem of purulo-necrotic complications of diabetic foot syndrome and tactics of surgical treatment. There is marked growth of case rate of diabetes in the recent years. Every second patient with diabetes is underwent surgical treatment, most of which are purulo-necrotic changes on feet, which occur with 28,6-65,0% of patients with diabetes [1, 2, 3]. Nowadays there's an opinion that diabetes negatively influences on wound process [3, 4], slows down adhesion of wounds, which get long and re-

crudescent character. Peculiarities of wound process are associated by disorders of tissue blood circulation in damaged areas, disorders of all types of metabolism, leading to development of acidosis, hypoxia and metabolic intoxication [5, 6], appearance of anaerobic- aerobic microflora in AA of purulent inflammation [7].

Aim of the work is comparable morphological research of wound process in patient with purulo-necrotic affect of lower limbs against diabetes.

#### Material and methods of research

Clinical data is based on the material, obtained while examining patients with purulent wound on foot. The main group (1 group) was 89 patients without diabetes; control group (2 group) – 93 patients with purulo-necrotic process on foot against diabetes (D). Average age, gender, character of purulo-necrotic process on foot and other parameters were consistent in the marked clinical groups. Morphological research consisted of the following methods: histologic (48 biopsy samples), immunomorphological (25 biopsy samples).

#### Histologic method

Biopsy samples were fixated in 10% neutral formol and according to traditional method were concreted in wax blocks. Made from wax blocks histologic cuts, 4-5 um thick were dyed with hematoxylin and eosin. Medications were studied and taken picture with the help of microscope DM LB (Leica, Germany) – videocamera JVC (USA) – computer Pentium IV system.

#### Imunne-morphological method

Peculiarities of granulation tissue in two group of examination were studied with the help of immunoperoxide method using 4 monoclonal antibodies. The same biopsy samples (25 from 48) were studied with histologic method. Antibodies by NOVOCASTRA, DAKO and Lab Vision to marker of vessel endothelium, antigen CD31 (allows visualizing vessels in tissues) and to collagen I type (for collagen formation estimation), to T- lymphocyte-helper (CD4) and T- lymphocyte-suppressor and killer (CD8) were used as primary specific antibodies.

Detection system «UltraVision LP Value HRP Polymer» (goat antibodies to rabbit and mouse), Lab Vision USA was used in order to visualize results of the reaction of connecting antigen with antibody. The result of reaction with antibodies to collagen was estimated according to traditional system of semiquantitative method in grades from 0 to 3 (absence of reaction, weak, moderate and expressed reaction), with antibodies to T- lym-

phocyte-helper, suppresser/killer – according to quantity of such cells in granulation tissue within sight microscopically enlarged X400.

Visualization of wound process was fulfilled, orientating on the following criteria: extent of degree of manifestation and duration of inflammatory presentation in the zone of wound (oedema, hyperemia, wound effluent), condition of wound bottom and also there were fixed periods of granulation presentation, beginning of epithelialization and healing of wound defects. Analysis of wound process was done according to stages of its development.

Research results and discussions. During morphological study of tissue samples before the treatment it was marked that tissues in wound zone are given necrotic changes in patients of both groups, leucocytic infiltration and numerous colonies of coccal bacteria were marked.

Derma and also elements of areola tissue were in condition of destruction with formation of numerous microabscesses. Besides that expressed microcirculatory disorder was marked in wound tissues: dilatation of vessels, occurrence of stasis in them, microthrombuses, destruction of vessel wall. Destructive processes with dissociation of myofibrils spread and onto muscular tissue.

Treatment of patients of the I and II groups was traditional (patients of the II group additionally had correction of carbohydrate metabolism) together with local one, led to reduction of oedema and hyperemia of skin around the wound. This happened in patients of the I group on the  $5,8 \pm 0,7$  day, while 30% of patients from the II group on the  $12,5 \pm 0,3$  day and 70% – on the  $14,9 \pm 1,2$  day. Wound cleansing from purulo-necrotic masses in patients of the I group happened averagely on the  $7,4 \pm 0,2$  day. The period shifted in patients of the II group 20% to  $16,9 \pm 1,2$  day, 58% to  $19,6 \pm 1,2$  day and 22% to  $19,9 \pm 0,9$  day.

Analysis of morphological research shows slowdown of wound process in the group of patients with D. The period of resorption and rejection of necrotic tissues in the wound is extended, long time there's seen oedema, which goes with data of different researchers [8].

Cytologic research of early exudates in patients of I and II groups add morphological pattern. Domination of neutrophilic leukocyte upto  $69,0 \pm 2,0$  in sight in patients of the I group and upto  $75,0 \pm 3,1$  in sight in patients of the II group was marked in cytograms. Number of destroyed neutrophils in this case was in the I group  $8,8 \pm 0,5\%$ ; with properties of degenerative changes –  $79,6 \pm 2,8\%$ ; quantity of neutrophils with saved structure was  $11,6 \pm 1,7\%$ . Cytologic pat-

tern of patients of the II group was alit different: degenerative and destroyed forms of neutrophils dominated ( $82,2 \pm 2,4\%$  and  $11,6 \pm 0,5\%$  correspondingly), while quantity of saved forms was  $6,2 \pm 0,5\%$ . In cytograms of patients of the II group there was significant quantity of microorganisms of coccal flora. Macrophages and polyblasts were missing. Incomplete phagocytosis in polynuclears was  $78,0 \pm 2,1\%$ . Type of cytogram of patients of both groups corresponded to degenerate-inflammatory, though a number of destroyed neutrophils dominated in patients of the II group. Transit to the second stage of wound process is followed by reduction of infiltration of soft tissues. Surface of the wound of patient of the I group covered granulation on the 7-10 day. Fascicles of collagen fibres dominated in granulation tissue, fusiform fibroblasts and fibrocytes were among them. The main function of these cells is apparently regulation of metabolism and mechanical stability of matrix. Angiogenesis is marked in granulation tissue. Process of regeneration is spread on muscular tissue, in which myotubes are often formed.

Process of transit to the 2<sup>nd</sup> stage is significantly slow downed in patients of the II group, in 1,5 times. Process of differentiation of fibroblasts and formation of collagen fibres is also slow-downed in comparison with the I group. Moderate quantity of newly formed vessels is marked. In histologic medications of patients with diabetes on the 14<sup>th</sup> day there's marked less content of macrophages in purulent wound (41% less than in the first group). Not enough content of macrophages, stimulating proliferation of fibroblasts and collagen synthesis, apparently, explains slowdown of processes of granulation formation. Analysis of hystograms of patients from the second group allows marking that wound process is followed by diabetic microangiopathy, expressed by derma changes, there's hyalinosis of connective tissue. Together with formation of granulation tissue after its quick cleansing from necrotic masses (II group) there may be again formed zones with necrosis and bacteria colonies. Character peculiarity of such appearances is cell reaction with weak or not expressed leucocytic infiltration. Presence of numerous microbial associations in pathologic focus, high extent of semination by tissue microbes slowdown periods of cleansing and wound healing in patients with complicated forms of diabetic foot. Changes in the system of cell and humoral immunity are often conductive to such development of wound process: fall of activity of T- and B AA lymphocytes (CD4, CD8). On the 18<sup>th</sup> day of wound process quantity of neutrophils in cytogram of patients of the 1<sup>st</sup> group was  $27,3 \pm 1,7$ , on the

25<sup>th</sup> day – they were not revealed. Type of cytogram corresponded to regenerative-inflammatory. However, patients of the 2<sup>nd</sup> group on the 25<sup>th</sup> day still could have changed forms of neutrophils in their cytogram, content of which was close to  $30,7 \pm 1,7$ . Inflammatory stage of wound process of patients of the 1st group transits to reparative one on the  $10,4 \pm 0,2$  day, while patients of the 2<sup>nd</sup> group – on the 20–27 day. Sizes of wounds become less by means of epithelialization and contraction of scar tissue. Together with regeneration of connective tissue of skin derma and its derivatives: hair follicle, there's regeneration of epithelial layer.

Thus, in case with purulent wounds of different genesis, their biological essence and consequence of the developments is the same. However, wound process in patients with diabetes is followed by a number of peculiarities:

- 1) reduction of number density of vessels of granulation tissue;
- 2) significant slowdown and disorder of maturation of granulation tissue, dystrophic disorders of collagen fascicle;
- 3) appearance of purulence locus of granulation and mature connective tissue.

Morphological pattern of diabetic angiopathies and neuropathies with microcirculation disorder conduces to hypoxia of wound tissues and together with reduction of cell and humoral immunity destroy the wound process, extending periods and stages of wound healing. All above mentioned shows the necessity of complex morphological estimation for effective control of wound process. The described method will allow correctly estimate its extent in order to work out and apply reasonable algorithm of antibacterial, analgetic, antiedemic, anti-inflammatory and stimulating reparative processes of treatment of purulent wounds of soft tissues, that with no doubt will allow improving quality of patient's life without increasing or with minimal operation activity.

#### References

1. Greenhalgh D.G. Wound healing and diabetes mellitus // *J. Clin. Plast.Surg.* – 2003. – Vol. 30, №1. – P. 37-45.
2. Gostishchev M.L., Afanasiev A.N. Standards of treatment-diagnistical measures in patients with diabetic osteoarthopathy and purulent-necrotic feet damage. // Collection of articles from the conference «Standards of diagnostics and treatment in purulent surgery». – Moscow-325, 2001. – P. 107–112.
3. Briskin B.S., Dibrov M.D., Khamitov F.F., Proshin A.V., Yakobishvili YA.I. Purulent-necrotic complications of diabetic foot syndrome

and yheir reflection in ICD-10 and standards of insurance medicine / *Surgery.* – 2007. – №1. – P. 49–55.

4. Svetukhin A.M. Surgery approaches in treatment tactics of purulent-necrotic forms of diabetic foot / A.M.Svetukhin, A.B. Zemlyanoi // Contemporary aspects of diagnostics, treatment, prevention of damages of lower limbs in patients with diabetes: scientific-practical conference. – M., 1996. – P. 177–183.

5. Dedov I.I., Antsifirov M.B., Galstyan G.R., Tokmakova A.Yu. Syndrome of diabetic foot. Clinic, diagnostics, treatment and prevention. – M., 1998. – 150 p.

6. Myasnik B.N., Abidov M.M., Karimov Z.Z. Scintigraphic evaluation of effective and innovative methods of surgical treatment of critical lower limb ischemia. / *Surgery.* – 2002. – №6. – P.48-51

7. Koshelev P.I., Karpukhin G.N., Gubin A.M. The use of antibiotics and intravenous laser irradiation of blood in complex treatment of purulent surgical diseases of the lower limbs in patients with diabetic angiopathy // *Angiology and vessel surgery.* – 1997. – №2. – P. 107.

8. Shulutko A.M., Antropova N.V., Kryuger Yu.A. No – therapy in patients with diabetes, complicated by purulent – necrotic damages of lower limbs // *Surgery.* – 2004. – № 12. – P. 43–46.

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**THE IMPACT OF THE EXPERIMENTAL  
HEART FAILURE UPON  
THE FUNCTIONAL MYOCARDIUM  
MORPHOLOGY AND  
THE CORRECTION OF THE  
ALTERATIONS WITH BISOPROLOL**  
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Heart failure is one of the most significant medico-social problems and is followed by alterations on different levels of heart organization. A great number of questions that regard reactive, adaptive, and reparative alterations of cardiomyocytes and stromal elements of heart is controversial and need accurate definition. The need of the studying of the restoration abilities of myocar-

dium and the possibilities of the realization of its compensation-adaptive mechanisms is conditional on the frequent involvement of the heart into the pathological processes. Deeper knowledge of the regenerative abilities and genetically-determined tissue processes is needed for the development and prognosis of the implemented treatment measures and medical preparations effectiveness. The introduced model of this research is the experimental heart failure and its correction with bisoprolol.

The point of the research is the comparative analysis of structure-functional and metabolic peculiarities of myocardium with experimental heart failure, and also the study of the reverse development of the destructively-alternated heart tissue possibility against the background of the bioprolol introduction.

#### Methods and materials

The research was carried out upon male rats of the Vistar line. The experimental heart failure was provoked by the described methods [1]. The animals were divided into groups: 1-intact animals, that has been kept in usual vivarium conditions; 2-animals with experimental heart failure; 3-animals with heart failure that has been receiving the medical preparation bisoprolol («Merck», Germany) intraperitoneally, in dose of 0,6 mg/100 g of mass. The histological study of the rats' myocardium was carried out according to the common method, the cuts were coloured with hematoxylin and eosin, hematoxylin-the main fuchsine-picric acid, toluid blue. The glycogen, succinate dehydrogenase (SDG), lactic dehydrogenase (LDG), cytochrome oxidase (COX) activity was analysed [2]. Morphometric analysis was carried out with point net of Avtandilov [3]. Electromicroscopical research was taken according to the common method. The tissue filling was done with usage of epoxy resins: epon-araldyte, the cut were contrasted by uranium lycetat and the lead citrate. The experimental research was carried out according to the European convention of the protection of vertebrate animals that are used for experiments and other scientific purposes (ETS N 123), (Strasbourg, 18th of March 1986). The statistic processing was carried out with usage of the application Statistica 6.0.

The discussing of the obtained results. Cardiomyocytes (CMC) of the intact animals have regular structure that correspond to its description in literature [4]. The volume density of cardiomyocytes was  $85,5 \pm 5,2\%$ ; the intercellular substance (that included the amorphous substance and collagen fibers) –  $14,5\% \pm 0,1\%$ . The correlation of CMC and intercellular substance was 5,9. The myocar-

dium stroma was represented by friable connecting tissue that twined around the cardiomyocytes and contained a big number of capillary which volume density was  $7,4 \pm 0,1\%$ .

The cardiomyocytes ultrastructure demonstrates the typical cellular texture. Myofibrillas are situated parallel to the lengthwise cellular axis, while intercalated discs that look like a zigzag line and cross the myofibrillas at the telophragma level are situated perpendicularly to it. Between the myofibrillas as tension bars the mitochondrions that usually have oval shape are situated. Lysosomes are among the mitochondrions. The lamellar complex is relatively weak. Granolas of glycogen that either lay single or form associations are revealed in retractive cardiomyocytes.

Experimental heart failure caused the destruction of the functional muscle «fibers» and showed a distinct heterogeneity of the cardiomyocytes population. Among usual heart myocytes the hypertrophied and atrophied ones were found. Contracture damages of cardiomyocytes were revealed, a weakening of the discs A anisotropy or the disappearance of the anisotropic structures in separate cardiomyocytes were present. The picture of miofibrillas lysis had place. Intercellular alterations were accompanied by the expressed myoplasm edema. The volume density of cardiomyocytes within the animal groups with the experimental heart failure decreased of 27% in comparison with the intact. The increase in stroma myocardium component took place at the same time, the raise in the microcircle channel volume, fibroblast cells, collagen fibers, and the major amorphous substance of the connecting tissue took place. The correlation between the CMC and stroma cells was 1,5 that is almost 4 times less than that of intact animals. Within the progress dynamics of the experimental pathology the blood capillaries were altered: the decrease in their diameter that was  $4,30 \pm 0,04$  mkm (against  $5,70 \pm 0,03$  mkm in control) was observed. Swelling endothelial cells jutted out into the capillary clear space. The loosening and edema of the perivascular connecting tissue was also present. The quantity analysis of enzymes demonstrated the decrease in the breathing elements activity. The CDG activity decreased of 23%, COX – of 58%, LDG – of 64%, the glycogen content in cardiomyocytes decreased of 64% accordingly, in comparison with the intact animals' myocytes. The ultrastructure analysis showed a significant alterations of the cellular energy apparatus. Among the regular mitochondrions the fragmentation and isolation of crists were observed. The number of destructively-altered mitochondrions prevailed and myoline figures were revealed between them quite often. The

tracts of cardiomyocytes miofibrillas were mostly separated, miofillaments were hohmogenated and had indistinct contours.

The introduction of the medical preparation bioprolol modified the morphological characteristic of cardiomyocytes. The kernel hyperchromy phenomena took place in cellular structures, as well as its displacement to the periphery, but that had an episodic character. The correlation between CMC and intercellular substance was 4,7. The introduction of the medicine was followed by the decrease in contracture myocardium damages. The heaviness and contracture spread degree was also decreased. The increase in cytochemical elements' activity in comparison to the animal group with experimental heart failure was displayed by their study: SDG – of 12%, COX – of 17%, LDG – of 5%, glycogen level – of 27%. The analysis of the ultrastructure cardiomyocytes organization revealed the phenomena of poorly exposed edema of heart myocytes. Miofibrillas, as a rule, had a usual structure. Mitochondrions were in different condition: most of them were comparable to the intact group, the others were in swelling and edema condition. The qualitative analysis of the electric microphotographies showed the increase in the mitochondrion content ( $27,3 \pm 0,5$ ), in comparison with animals that had experimental heart failure ( $15,6 \pm 0,4$ ). However, their level did not reach that of intact rats ( $29,1 \pm 0,7$ ). The number of lipid inclusions was significantly decreased and some electric microphotographies showed no lipid drops.

#### Conclusion

Thus, the analysis of the experimental material testifies that the structural myocardium alterations of the Vistar line male rats was func-

tional. The introduction of the medical preparation bisoprolol with the experimental heart failure decreased the cardiomyocyte damage degree on cellular and subcellular level of the myocard organization and also boosted the cardiomyocytes metabolism. All that shows the positive impact of the medicine that makes the backward development of the destructive alterations that were caused by the experimental heart failure possible

#### References

1. Bikova O.S. The myocardium condition with the experimental heart failure // *Clinical medicine: Interinstitutional anthology of the CIG.* – Velikiy Novgorod. – Almaty, 2008. – V. 16. – P. 21–25.
2. Pirs E. *Histochemistry. Theoretical and applicable.* – M., 1962. – 1963 p.
3. Avtandilov G.G. *Medicine morphometry.* – M.: Medicine. – 1990. – 383 p.
4. Nepomnjashikch L.M., Nepomnjashikch G.I., Lushnikova E.L. *Morphogenesis of the main general biological processes in organs and tissues of men and animals: 5 scientific discoveries in the area of biology and medicine // Moscow: Russian academy of medical science.* – 1998. – 183 p.

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*Short Reports*

**PERSPECTIVE DIRECTIONS  
OF LUMBERING JUNK USAGE  
AND WOODWORKING  
IN KRASNOYARSK REGION**

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Krasnoyarsk region with its area of 233,97 million hectares (13,8% of the total country territory) is in possession of the biggest wood resources in Russia (7,8 billion m<sup>3</sup> or 9,4% of total country wood deposits; 62,0 million hectares are covered with forest, which is 14,5% of total country wood-covered territory).

Annually a procurement of about 10 million m<sup>3</sup> of wood is carried out on the main hewings (15% of the accounted cutting area), and considering all types of hewing – 13 million m<sup>3</sup>.

The main reason of the accounted cutting area incomplete use is the decrease in lumbering amounts because of the effective market loss, high wearing of the equipment (both logging and wood-processing), destruction of the infrastructure (that has been built in soviet times), high costs level for procurement and removal of the business wood etc. All that condition the low investment attraction of the wood industry and leads to the worsening of the situation.

The analysis of the possessed information shows us that timber processing complex experiences difficulties, the main reasons of which are:

1. The limited wood market.
2. High level of costs for the wood procurement and removal.
3. Low-developed infrastructure (roads, energy, transportation, productive).
4. Low investment attraction of the wood sector.
5. Significant volumes of illegal (unrecorded and uncontrolled) cutting and the increase in the shadow wood products turnover.
6. Human resources problem.

A high wearing percent and the insufficiency of the wood-processing facilities, includ-

ing those of deep chemical-mechanical wood processing, worsens the problem of complex stocked wood usage. As a result, a significant quantity of wood mass (low-grade coniferous, deciduous wood and wood junk) is not used and leads to the accumulation of a big number of waste that needs utilization. Unused and abandoned wood mass is not only the source of physical (area pollution) and chemical (extraction of various compounds, the discharge of the decomposition products etc) environment pollution, but also is potentially dangerous object of flash origin and vermin breeding ground development.

Considering the dynamics and volume of wood procurement both in Russia and within Krasnoyarsk region in particular, the necessity of more active usage of wood junk and low-grade wood that is stocked and is accumulated every year becomes one of the most importance.

The following wood procurement junk usage directions are considered to be the most perspective:

1. The output of various types of bio-fuel (the usage of biomass energy) such as pellets, fuel briquettes, bio-mazut, bio-diezel, bio-coal, active wood coal, biogas.
2. The output of wood compositive slabby materials (wood-particle boards, laminated wood-particle boards, wood-fiber boards, light cellular boards).
3. The output of chopped wood based products (wood flour).
4. The output of slabby materials based on non-organic binders (cement wood, gypsum-chopped board, cement-chopped board).
5. The output of wood-chemical production (biologically-active substances).

#### References

1. Forest map of Krasnoyarsk region – stated by the region's Governor on 26.12.2008. – № 219.
2. The development of wood stocking and processing activity. Sectoral program for 2007-2017. – Krasnoyarsk, 2007. – 209 p.
3. Krasnoyarsk region Administration Website – access conditions: <http://www.krskstate.ru>.

### THE PROBLEMS OF THE SYBERIAN HYDRO POWER STATIONS EXPLOITATION

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The accident of the Sayano-Shushenskaya HPS showed us, that all the possible situations and the causes of possible damages should be considered while planning, building and exploitation of HPS.

The international commission of large dikes (ICLD) carried out a global selection of the information on the dikes destruction that displayed the growth of attention to the estimation of dikes safety. However, the attached data say that about 20% of dikes, built within the last three decades, do not have the estimation of their safety.

Unfortunately, in the ICLD report and scientific publications, a water pool is usually considered as a water storage reservoir, though according to the capital costs for its building and preparing to being filled and nature protective measures they make up to 20-50% of the sum hydrocomplex costs.

The peculiarity of building large HPS in Syberia is that water pools are created on forest-covered territories with a deposit of wood-bushes vegetation of app. 200 m<sup>3</sup> for a hectare.

Water pools that were created in forest-covered area became not only transport arteries with new morphological characteristics, but also the sources of active impact on nature.

The economic inexpediency of wood-cutting measures on areas with conifer wood deposits less than 50 m<sup>3</sup> for a hectare that was defined on the planning stage served as a cause of the refusal of these measures and planned bed flooding on Sayano-Shusheskoe, Krasnoyarskoye, and Kureiskoe water pools with sum volume of 2,85 millions m<sup>3</sup>. Beds of Ust-Ilimskoe and Bratskoe water pools with sum volume of 5,6 million m<sup>3</sup> were planned to be flooded for the same reason. In the bed of Boguchan water pool 2,2 million m<sup>3</sup> is planned to be flooded. Thus, the planned volume of wood flooding in HPS beds of Angar-Eniseyevskiy region (AER) was supposed to be 10,65 million m<sup>3</sup>. However, the real volume of flooded wood is significantly bigger. In the Krasnoyarskaya HPS water pool bed 0,47 million m<sup>3</sup> was flooded, in Kureyskaya HPS – 1,72 million m<sup>3</sup>, in Sayano-Shushenskaya HPS – 3,5 million m<sup>3</sup>, in Bratskaya HPS – 12,0 million m<sup>3</sup>, in Ust-Ilimskaya HPS –

5 million m<sup>3</sup>. Thus, 22,69 million m<sup>3</sup> were flooded in the AER water pools beds. Considering the flooding volume of in the Boguchanskaya HPS water pool bed planning of 2,0 million m<sup>3</sup> the sum volume of flooded wood is 24,69 million m<sup>3</sup>.

Floating and flooded wood has a relatively low impact on the water quality of the water pool (3-5% of the total pollution volume). However, its accumulation in bays, by coastlines, and in river mouth areas can provoke the creation of stagnant areas with a acute alteration of hydro-chemical composition. Small depths in the mentioned water pool areas, the increase in its temperature, and its pollution by biogenic and organic wood substances create favourable condition for the emerging of blue-green algae that leads to the worsening of gas content etc.

A complicated ecological situation in the majority of Russian region made the problems of management and rational usage of water and wood resources that provide for a normal human vital functions and stable functioning of natural environment the most important one.

The flooded wood is the one of extremely poor quality, it is not in demand, and its physical-mechanical qualities are lower than those of damp-growing wood. The collection and production of flooded wood are unprofitable and the technology of its processing is low-productive. But, considering that the floating wood can be a great threat to HPS, has a great impact on the water quality, and lower the recreation attraction of the water pool, measures aimed for the water area cleaning should be systematically carried out, as the process of paddling wood deposit replenishment is continuous.

The cleaning of water pools and rivers from the flooded and floating wood mass is a complicated technological process that requires a number of researches:

- natural inspection of floating wood and wood junk accumulation areas with the definition of fraction and qualitative content analysis of wood that has been carried along the shore and is floating within water pool;
- the preparation of wood deposits in river bays and on the coast;
- the implementation of qualitative-chemical water analysis in areas of floating wood concentration;
- the development of technologies and technological measures of wood gathering and removal;
- theoretical estimation of the concentrated wood warehousing impact on the environment;
- the definition of product composition, that can be obtained from floating wood, and possible ways of its realization.

**THE CONNECTION OF ENDOTHELIAL  
FUNCTIONS INDEXES IN BLOOD SERUM  
WITH HEMOSTASIS OF PATIENTS  
WITH ALLERGIC VASCULITIS**

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The combination of vascular and hemostasiological disturbances in skin can act as an important pathogenetic moment in the development of allergic vasculitises. It is known that NO affects the processes of blood coagulation [4]. The mechanism of its anti-thrombotic effect is conditioned by the decrease in platelet aggregation and the adhesion of shaped blood elements to the vascular endothelium. The disturbances in the NO-system can lead to the disbalance of these natural laws, the intensity degree of which is dependent on the degree of the pathological process intensity.

One of the most widespread mechanisms of allergic vasculitises is the endothelial dysfunction, which is usually an inadequate production of nitrogen oxide (NO) by the vascular endothelium in response for the adequate stimulus (geodynamical impact, cholinergic stimulation etc).

The NO level in endothelial cells is regulated by the activity of NO-synthase (NOS), from which important are the endothelial NOS (eNOS). In the conditions of the disturbances in NO synthesis an induced NO (iNOS) can be involved, which is 100-1000 times more active in the intensity of NO synthesis than eNOS [7, 8]. The iNOS marker – nitrate reductase (NP) which acts synchronously with iNOS is usually used to estimate its activity [65]. When the iNOS activity in tissues and cells is high the NO content is increased avalanche-like. NO forms a toxic and high-reactive compound – peroxynitrites (ONOO<sup>-</sup>) [63] under conditions of hypoxia and the high concentration of superoxide anion O<sub>2</sub><sup>-</sup> caused by it. The alterations in NO, eNOS, iNOS, and ONOO<sup>-</sup> levels reflect the condition of endothelium NO-synthase mechanism of vascular tone regulation [4, 5, 6, 7, 8].

**Materials and methods of the research**

The research of endothelium function was based on the clinic-laboratory inspection of 226 patients with vasculitis and 20 almost healthy people of the same age.

The NO level was defined according to the sum of the major metabolites (NO<sub>2</sub><sup>-</sup> and NO<sub>3</sub><sup>-</sup>), endothelial NO-synthase (eNOS), nitrate reductase (NR), and peroxynitrites (ONOO<sup>-</sup>) [3]. The data obtained once from almost healthy volunteers

served as a control for all groups. ADP-induced platelet aggregation (APA), fibrinolytic activity of euglobulin clot (FAEC), Vilebrand factor (Vf), and anti-aggregation activity of the vascular wall (AAVW) were also studied within the same patients.

**The results and their analysis**

The NO level in blood serum within the patients of the first group increased of 31,1% and within the patients of the second group – of 36,9% comparative to the data of the control group. The activity of endothelium eNOS within the first group decreased of 20,3% and within the patients of the second group – of 27,5%, and the nitrate reductase increased of 32,5% within the patients of the first group and of 61,3% comparative to the control group.

With the increase in NO concentration under the conditions of hypoxia and the high concentration of superoxide anion O<sub>2</sub><sup>-</sup> forms toxic and highly-toxic compound peroxynitrites (ONOO<sup>-</sup>) with it, which increases up to 0,12 within the patients of the first group and up to 0,16 within the patients of the second group.

The credibility of the alterations proves that the increase in NO level and free radicals level creates the conditions for the ONOO<sup>-</sup> synthesis and leads to a significant increase in its local concentration in the vascular wall. ONOO<sup>-</sup> is extremely toxic in high concentration, it induces apoptosis, breaks the prostacycline synthetase system function (by blocking the prostacycline synthesis and strengthening the thromboxane synthesis), causes the fragmentation of proteins by nitrating of amino acids and lipid proteins, induces the oxidation of low-density lipoproteins (LDLP), in other words, leads to the irreversibility of the reversible tissue breath oppression under the influence of NO and ONOO<sup>-</sup>.

The received results of the NO-system research reflect the presence and the degree of endothelium functions disturbance, and the endothelium dysfunction within the patients with allergic vasculitis is one of the early forerunners of thrombotic complications. The formation of free oxygen radicals suppresses the NO-synthase activity which is the catalyst of the NO synthesis and the platelet aggregation inhibitor that shows anti-thrombotic impact in the vascular endothelium [1, 2]. In turn, as a result of the endothelium damage the concentration of Vilebrand factor is increased which leads to the strengthening of platelet aggregation and their adhesion to subendothelium, the formation of thrombi in micro-vessels, and the worsening in rheological blood characteristics disturbances.

This data testifies the disbalance between the oxygen radicals formation level and anti-oxidant organism system that affect the interaction of cellular factors and vessels endothelium thus creating the conditions for the development of hemocoagulation and immune regulation disturbances under the allergic vasculitis.

In the acute phase of allergic vasculitis a significant worsening of all hemostasis indexes and, first of all, those that are dependent on endothelium is revealed.

The ADP level of induced platelet aggregation within the second group was increased of 27,7% more than the indexes of the first group ( $P < 0,001$ ), and of 54,2% more than the data of the control group ( $P < 0,001$ ). The maximum platelet aggregation activity was revealed within the group of patients with acute allergic vasculitis course.

The AAVW study within the patients with allergic vasculitis revealed its decrease. AAVW within the second group was lower than first group indexes by 26,0% ( $P < 0,001$ ), and by 43,2% lower than those of the control group ( $P < 0,001$ ).

The FAEC within the patients of the first group was in average oppressed down to  $184,5 \pm 1,2$  min, and within the second group patients – down to  $219,7 \pm 1,6$  min. Thus, within the patients of the second group the oppression of fibrinolytic activity of 19,1% lower than that within the patients of the first group ( $P < 0,001$ ), and of 51,5% lower than the control group level ( $P < 0,001$ ). The FAEC level of the control group was in average  $145,0 \pm 1,8$  min.

A correlation average straight connection (correlation coefficient  $r = 0,42$ ) was revealed between the NO level in blood serum and the ADP level of induced platelet aggregation. Along with the increase in NO synthesis the ADP content of induced platelet aggregation id also increased.

Also the relations between No level and highly-reactive compound peroxinirites ( $\text{ONOO}^-$ ) was revealed (correlation coefficient  $r = 0,70$ ). Correlation analysis showed that a strong straight connection exists between the increase in NO synthesis.

## Resume

Under allergic vasculitis the disturbances of NO-synthas mechanism are observed. They are expressed by the decrease in the formation of NO that is produced by endothelium cells and its quick inactivation as a result of the formation of highly-toxic product  $\text{ONOO}^-$  by the increase in HP ferment activity that leads to the suppression of NO-synthas activity that promotes for the creation of NO. This disbalance in NO-system under the allergic vasculitis leads to the progression of endotoxiosis and the disturbances in hemostasis systems and immunity.

## References

1. Barkagan Z.S., Momot A.P. The Basics of the hemostasis disturbances diagnostics. – M. 1999. – 167 p.
2. Dolgov V.V., Svirin P.V. Laboratory diagnostics of hemostasis disturbances. – M., 2005. – P. 79–83.
3. Komarin A.S., Gorbunov B.N., Damionova L.T. Diagnostic significance of the nitrate reductase activity and the nitrogen oxide products determination under the acute toxic liver affection. Method. Recom. – Tashkent: 2001. – 13 p.
4. Malishev I.Y. The introduction into the nitrogen oxide biochemistry. The role of nitrogen oxide in the regulation of major organism systems. Russian magazine of gastroenterology, hepatothology, and coloproctology. – 1997. – №1. – P. 49–55.
5. Markov C.M. Molecular mechanisms of the vascular endothelium disfnctions // *Cardiology*. – 2005. – №12. – P. 62–72.
6. Pokrovskiy V.I., Vinogradov N.A. Nitrogen oxide, its physiological and pothophysiological characteristics. – *Therapeutist, Archangelsk*, 2005. – P. 82–87.
7. Awolesi M.A., Sessa W.C., Sumpio B.E. Cyclic strain upregulates nitric oxide synthase in cultured bovine aortic endothelial cells // *J. Clin. Invest.* – 2005. – Vol. 96. – P. 1449–1454.
8. Busse R. Machanisms of Nitric Oxide Release from the Vascular Endothelium // *Circulation*. – 1993. – Vol. 87, №5. – P. 18–25.

*Materials of Conferences*

**PHYSICAL EDUCATION  
OF FITNESS GROUP STUDENTS  
OF UGRA STATE UNIVERSITY**

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One of the problems of higher education system is maintenance and strengthening of population health, giving the youth access to physical training. The analysis of science and special literature (A.A. Andriyevskiy, 2005, T.M. Bulkova, 2007, G.A. Bulatova, 2004, J.I. Busheva, 2009) shows that the problem of improvement of physical education process in higher school is of great importance. This problem is especially urgent for students with health deviations. As some specialists note (E.G. Bulitch, 1986, V.M. Krilov, 2000, A.A. Sidorov, 2000), there is a number of contradictions in the approach of fitness groups composing, in organizing and form of conducting the classes, in their orientation and content, in the means and methods applied. Efficiency of teaching in fitness groups is impossible without valid organization of educational process, which will contribute to health strengthening, organism training, rise of physical and functional readiness level, improvement of organism adaptation to physical load and environment. The problem given is of especially great importance for students studying in severe climatic conditions of Khanty-Mansi Autonomous Area. Thus, necessity to raise the efficiency and quality of modern professional education on the one hand, and insufficient development of process organizing approaches in physical education of fitness group students in higher education on the other hand, determine the urgency of our research. **The object of research** is the process of physical education of fitness group students of Ugra State University. **The subject of research** is methodology of physical education of fitness group students of Ugra State University. **The purpose of research** is to improve methodology of physical education of fitness group students of Ugra State University.

**Research tasks:**

- 1) To study organizational and pedagogical conditions of physical education process at Ugra State University in the period from 2006 to 2008.
- 2) To analyze the process organization of physical education of fitness group students at Ugra State University in the period from 2006 to 2008.
- 3) To devise innovative methods of physical education of fitness group students.

4) To prove efficiency of developed innovative methodology of physical education of fitness group students.

**Research methods:** analysis of scientific and methodological literature, pedagogical observation, educational experiment, structured modeling, questionnaire survey, mathematical statistics methods.

**Research organizing**

Research was carried out at Ugra State University from September 2006 till May 2008. 147 first-, second- and third-year students of fitness group of Ugra State University took part in this research.

The first stage (2006-2007) included pedagogical observation of organizing the process of physical education of fitness group (FG) students. Organizational and pedagogical conditions of physical education process conducting at Ugra State University were studied.

At the second stage (2007–2008) educational experiment with adoption of innovative methods of physical education of FG students was carried out. Effectiveness of methodology was defined by the results of attendance and academic performance.

The number of excused and unexcused absences was analyzed, and also FG students academic performance according to the results of progress assessment in the middle of the term (October, April). The questionnaire survey of FG students was carried out. The form included 10 questions aimed at determination of interest in physical training classes.

For statistical data manipulation the software Statistica 6.0 was applied. The following factors were calculated: sample size ( $n$ ), mean value ( $\bar{x}$ ), minimum, maximum, standard deviation ( $\sigma$ ), standard error. Distinction reliability was assessed by Wilcoxon test. Correlation analysis was carried out with the help of Spearman rank correlation factor.

**Results of research**

The analysis of organizational and pedagogical conditions of conducting physical educational process at Ugra State University in 2007–2008 indicated that the legislative basis in the large had remained the same. It is possible to note that there is considerable improvement of sporting facilities and equipment. The number of instructors working with FG students increased, their level of proficiency raised. The number of

innovative training programs in physical education of FG students of Ugra State University increased. The number of students in academic year 2007–2008 was 343, that is by 2,3% more than the previous year. Average headcount of students in a learning group increased by 3 students in comparison with academic year 2006–2007 and made up average 15 students.

Educational process of physical training of fitness group students is possible to present as a pedagogical model reflecting its structure in different periods of teaching. In 2006–2007 it can be shown in three blocks: organizational, educational-training, progress testing. In 2007–2008 five blocks were distinguished: organizational, prognostic, educational-training, diagnostic and remedial.

*Organizational* block provides with «targets and development lines of the planning process» (L.P. Matveyev, 1991). This block integrates information about such factors as: program-regulatory basis; facilities and equipment; type of contingent diseases; climatic and geographical conditions.

In 2007–2008 the pedagogical model structure was supplemented with prognostic block. In its structure *prognostic* block consisted of: assessment of physical readiness level; chart of physical development and functional state assessment; self-assessment of health (health scale SF-36v.2). While in the academic year 2006–2007 forming of fitness group was carried out only according to the students' medical cards.

*Educational-training* block in both models was aimed at solving the problems of appropriate training programs. In 2007–2008 for the first time the training program included physical training competition «Wellness Latino» for FG students of higher school. Training of FG students for participation in the contest was put into practice in educational-training block.

In 2006–2007 FG students' performance score and control was carried out in progress-testing block. In 2007–2008 differentiated and objective process monitoring and assessment of students' learning activity results were provided by the diagnostic block. Efficiency criterion of mastering of curricular material on physical education, both theoretical and practical parts of the program, was getting a credit for the course.

*Remedial* block provided for individualization and remedy of students' learning activity. The structure of remedial block included: involvement of modified students into educational process; giving an opportunity for students with initially low health status to attend remedial physical training classes; making the theme research work.

Results of repeated questionnaire survey revealed heightened interest of fitness group students to physical training classes.

Analysis of absence from classes of FG students in the academic year 2006–2007 and 2007–2008 indicates decrease of number of excused absences average by 7,4%, and unexcused absences – by 14%. Distinction between attendance indexes for the given researched periods is statistically reliable ( $p < 0,05$ ).

Comparative analysis of students' progress assessment results showed that in the second term of the academic year 2006–2007 the indexes decreased by 5,1% in comparison with the first term. In the second term of 2007–2008 this index increased by 12,6% compared with the first term.

Rank correlation factor between indexes of students' attendance and progress assessment in the first term of 2006–2007 was  $r = 0,94$ , in the second term it was  $r = 0,92$ . In 2007–2008 this factor decreased and it was  $r = 0,85$  и  $r = 0,68$  respectively. It is possible that the decrease of correlation dependence in 2007–2008 compared with the previous academic year reflects, to some extent, increase of quality of students' mastering of curricular material, which influenced the progress assessment.

Thus, summing up the results of educational experiment it is possible to conclude the following:

1. Organizational and pedagogical conditions of physical education process at Ugra State University in 2008 compared with 2006 are characterized by better facilities and equipment basis and by higher proficiency of academic staff.

2. The structural model of organizing the process of fitness group students physical education of Ugra State University in 2008 compared with 2006 was expanded from three to five blocks due to availability of modern diagnostic equipment for examining functional state of organism. To the organizational and educational-training blocks prognostic, diagnostic and remedial ones were added.

3. Developed innovative methodology of physical education of fitness group students at Ugra State University has proved to be more effective than the one used in 2006–2007. Attendance of classes increased average by 41,7%. The number of unexcused absences decreased average by 41%. It provided for increase of FG students motor activity.

4. Comparative analysis of progress assessment results of fitness group students showed that in 2007–2008 this index increased by 55,9% compared with 2006–2007. This index corresponded to the two-point mark. Rank correlation factor be-

tween attendance index and progress assessment index in 2007–2008 decreased average by 17,7%.

5. Developed innovative methodology of fitness group students physical education contributes to broadening of theoretical knowledge and practical skills. During the survey the number of answers «I don't know» was by 61,5% less than it had been before. The number of students who found difficulty in replying the question about influence of physical education on people's health decreased average by 69,3%.

6. Individualization of the training classes, optimization of exercise load in accordance with functional abilities of students had a great influence on their interest to the training classes, on the forming of correct attitude to their health and healthy life style. By 89,7% more students began training regularly at the end of academic year 2007–2008. Average by 50,7% less students pointed out the reluctance and lack of interest to independent physical training. The key motive for physical education of fitness group students was training for the competition «Wellness Latino» which combined theoretical and practical parts.

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**THE FORMATION OF A TUTOR  
AS A SPECIALIST WITHIN THE PROCESS  
OF SCIENTIFIC-PEDAGOGICAL  
RESEARCH ACTIVITY WHILE  
STUDYING THE NATURAL SCIENCE**

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Modern society that is interested in its own development and the solution of numerous scientific, economic, and other problems, shows the demand for the upbringing of creative pedagogues, that would help it to solve those problems. Changes, that happen in modern society demand the correction of not only the content, but also methodological, pedagogical, and technological aspects of the tutor's training.

In this research we will speak about the preparation of the natural science faculties students of pedagogical higher educational institutions to their professional activity within their scientific-research work process. A committed comprehension of subjects and phenomena of our reality within the educational system that is carried out according to a plan is attributed to scientific research in pedagogy. In our work the natural science circle disciplines that are studied in pedagogical higher education institutions will be analysed. Natural science that is used by a man for the cognition of the world is being developed intensively nowadays. It differs much from separate special learnings by its integral view upon the processes and phenomena and gives us the ability to overcome the crisis of the modern knowledge system that can be observed in physics, biology, chemistry [6, P. 5]. The questions of classification and interaction of the natural sciences are still being discussed. The most common point of view is that physics, biology, and chemistry are the basic sciences [6, P. 14-15].

In the textbook «Modern concepts of natural science» the following categories are outlined: mathematics (chapter 2. Natural science and mathematics), physics (chapter 3. Scientific revolutions within the concept basics of physics), chemistry (chapter 5. Chemical concepts), geography (chapter 6. Conceptual content of the Earth sciences), biology (chapter 7. Biological conceptions), and physiology (chapter 8. Anthropological conceptions) [1, P. 3-6].

Nowadays a sufficient number of textbooks on ecology has emerged («Ecology» – V.I. Korobkin, L.V. Peredelskiy; «General ecology» – A.S. Stepanovskiy; «Ecology» – N.A. Brodskaya, O.G. Vorobiev, and others; «Ecology» – A.I. Adgirevich; «Ecology» – T.A. Akimova, V.V. Haskin and other textbooks). Almost all the textbooks claim that ecology as a science is based upon the studying the natural science disciplines, and that the questions of the combination of modern biosphere and technosphere, that has been created by men (the system «human-economy-biota-environment») are studied here.

The point of the studied question is the formation of ecological culture of the future tutor through natural science cognition within his scientific-research, scientific-pedagogic, and scientific-methodological activity. The ecological culture is an affirmation of the natural management principles and the skills to solve social-economical problems without the impact on the environment

and people's health in a man's mind and his activity [2, P. 34]. The condition of the formation of the ecological culture of the pedagogical higher education institutions students is the «ecologisation» of the natural circle disciplines. High ecological culture must become an important qualification criterion of the secondary school tutor.

Scientific-research work while studying natural science disciplines by students of pedagogical higher education institutes represents the study of the environment object within the process of studying chemistry, biogeography, physics, and geography. This is process of the basic qualities of eco-cultured personality of a future pedagogue formation. Such pedagogue is able to transform ecological values and realize the strategies and technologies of eco-pedagogic activity through natural science content and psychological-pedagogic and methodological knowledge [7, P. 158].

Scientific-pedagogical work of the pedagogical higher education institutions students is the process and the result of scientific activity that is aimed for the obtaining new social knowledge on the pattern, structure, mechanism of teaching and upbringing, theory and history of pedagogy, methods of the educative work organization, its content, principles, tools and organization forms [5, P. 208]. Scientific-research exploratory work in pedagogy, according to P.I. Pidkasytyi, is the securing of the organization of the searching creative activity of the studied within the solution of their new problems. Methods of scientific-methodological research are the methods, procedures, and operations of empiric and theoretic study of the reality. This system is defined by the initial researcher's conception, his ideas on the essence and the structure of the studied object, general methodological orientation, goals and problems of the researcher [5, P. 207].

Within the sphere of natural science nowadays a modern school needs flexible, mobile and competitive pedagogue. A secondary education institutions need teachers in the area of natural science disciplines that can:

- establish confidential relations with the students, that will help them to achieve positive results, motivate them for their future activity;
- influence the formation of students collective, creation of the environment favourable to their life and communication;
- analyse pedagogical situations, point out the main, significant for the selection and structur-

ing of their activities content, formulate education and training goals;

- form the integral knowledge system on the nature, society, human and the value approach to the environment within the students;
- develop creative abilities within the students their capabilities and inclinations in different types of socially-significant activity.

Also in order to master the mentioned skills a modern tutor must know:

- major legislative documents that concern the education system and regulate educational activity, subjects of the educative process' rights and duties;
- pattern of the education process and the education principles, its main directions and specific content of one natural science discipline;
- basics of the educational activity of a tutor as a class leader, methods of the revelation of leader, levels of the school self-government development, students' civility diagnostics;
- organization structure and scientific-methodological securing of the students' education;
- basics of the pedagogic innovation, modeling of the education systems and the conditions of their development [3, P. 67].

Mastering of these necessary skills and knowledge by the future tutor of natural science circle is promoted by deep study of the natural science content and the comprehension of scientific-pedagogical, scientific-methodological and scientific-research activity within the pedagogical institution of higher education.

The goal of the pedagogic institute is to transform a passive student, comprehensive absorbent of scientific information into the assiduous executor that solves standard problems, to train the specialist that can creatively obtain knowledge and who values not only the sum of knowledge, facts and comprehended disciplines, but also the development of the creative intelligence and flexible thinking. All that defines the intellectual potential of the society, the competitiveness of the country, and its place in the geopolitical space [4, P. 12].

Thus, the scientific-research work within the process of mastering natural science disciplines, scientific-pedagogic and scientific-methodological research work in the pedagogic institutions of higher education must provide the basics of the creative activity of the future pedagogue. At this stage of mastering this profession the students gain the ability to show their creative activity. And

this will serve a good platform for their creative pedagogic activity in future.

#### References

1. Conceptions of modern natural science / V.A. Kanke. Textbook for institutions of higher education. – Ed. 2. – M.: Logos, 2002. – 368 p.
2. Ecology teaching at school / A.V. Mironov. – M.: Vldos, 2004. – 220 p.
3. Innovative educational activity in technical institution of higher education / P.N. Osipov. Methodological manual for the system of retraining and qualification rising of the high school tutor. – Kazan: Shkola, 2007. – 224 p.
4. Preparation of students to their creative pedagogic activity / P.I. Pidkasisty, N.A. Vorobieva. Learning-methodological manual. – M.: Pedagogic society of Russia, 2007. – 192 p.
5. Dictionary-reference book on pedagogy / Author team of V.A. Mizherikov; under general edition of P.I. Pidkasisty. – M.: Sfera, 2004. – 448 p.
6. The basics of modern natural science and ecology / S.S. Timofeyeva, S.A. Medvedeva, E.Y. Larionova. Series «Textbooks, learning manuals». – Rostov-on-Don: Fenix, 2004. – 384 p.
7. Formation of the ecological culture within the studying of natural science by the students of the pedagogic institutions of higher education / S.M. Fairushina. Monography. – Kazan: Shkola, 2008. – 172 p.

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*Materials of Conferences***LAW OF SECULAR PLANET SHIFT**

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Using the Quantum theory of gravitation (QTG) the decrease of Earth's and Mars' orbital radius, caused by their gravitation absorption, have been calculated. The obtained result is in agreement with data of radio metering of an interplanetary space vehicle «Viking», directed to Mars in 1975.

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The motion of planets of solar system in their orbits around the sun meets three laws of Kepler [1]. These laws come from the Newton's law of gravitation and the law of conservation of mechanical energy

$$W = W_k + W_n = \text{const.}$$

Kepler formulated his laws in the following way:

- All planets of solar system move in elliptic orbits, in one focus of which is the sun.
- The line connecting the planet and the Sun sweeps out equal area in equal time.

– The square of the orbital period of a planet is directly proportional to the cube of the semi-major axis of its orbit.

– From conservation of mechanical energy it comes that all planet orbits are static and planets' periods around the sun are constant.

In the Quantum theory of gravitation (QTG), worked out by the author [2, 3] there's used a concept about flux of gravitons, filling the Universe and being energetic basis of gravitation. Despite incredibly weak character of graviton interaction with a matter, some part of them is still absorbed by bodies, whereby the gravitation interaction appears. As a result of this absorption, mass of bodies is increased. It is not a great difficulty to estimate relative increase in mass caused by the absorption of gravitons in terms of QTG.

In the work [2] there has been introduced a concept – effective flux density of gravitons, that is density of that part of the flux of gravitons that is absorbed by the matter. It was also found that the effective density of graviton flux depends on the matter density ( $\rho$ ) in which their absorption takes place and has the following form:

$$\rho_g^{\text{eff}} = 2,5 \cdot 10^{-15} \cdot \rho.$$

Taking this into consideration it is clear that in the body with volume  $V$  mass ( $\rho_g^{\text{eff}} \cdot V$ ) will be

absorbed, and consequently the relative increase of mass will be:

$$\frac{\Delta M}{M} = \frac{\rho_g^{\text{eff}}}{\rho} = 2,5 \cdot 10^{-15}.$$

The increase of mass happens during time order  $V^{1/3}/C$ , where  $S$ - is speed of gravitons presumably coinciding with the speed of light.

Slowdown of mass  $M$ , moving with speed  $V$  with graviton flux can be quantitatively de-

scribed by introducing negative acceleration, value of which is usually found by dividing force by the mass  $W = F_{\text{mop}}/M$ .

Using the concept of effective density of graviton flux we have that velocity pressure [4] has the following value:

$$p = \rho_g^{\text{eff}} \cdot \frac{v^2}{2},$$

where  $v = wR_0$  (linear velocity of a stellar body, caused by its orbital motion).

Therafter, full deceleration force will be:

$$F_{\text{mop}} = \rho_g^{\text{eff}} \cdot v^2 \cdot \frac{S}{2},$$

where  $S = pR^2$  – cross-section area of a stellar body.

Taking into consideration that the work of decelerative force leads to a decrease of total en-

ergy of the body, we get the following expression for a value of orbit radius change (law of secular planet shift):

$$\frac{dr}{dt} = 2k(kt - a^{1/2}),$$

where 
$$k = \frac{3}{8} \cdot \frac{\rho_g^{eff}}{\rho} \cdot \frac{(\gamma Mc)^{1/2}}{R},$$

$$\frac{\rho_g^{eff}}{\rho} = 2,5 \cdot 10^{-15},$$

$R$  – is planet radius,

$a$  – is a semi-major axis of the orbit of the planet at initial time.

As it is reported [5, 6] the results of radio metering of the interplanetary space vehicle «Viking», directed to Mars in 1975, showed the

Earth's shift towards the Sun about 30–40 meters a year, and Mars more than 100 meters. In a summary table 1 there introduced calculation results of shifts of some planets towards the Sun according to the formula of the law of secular planet shift towards center body (the Sun) and the results of radio metering of the interplanetary space vehicle «Viking», directed to Mars in 1975. It is clear, that there is agreement of these data with the theoretical estimate. This is a weighty evidence of reasonableness of the law of secular planet shift towards center body (the Sun).

Stellar body	$W, m/c \cdot 2 \cdot 10^{-13}$	$\Delta R_{theor}$	$\Delta R_{observ}$
Mercury	9,4	68,5 m	–
Earth	1,3	40,9 m	30-40 m
Mars	1,5	85 m	more 100 m

As it has been already marked earlier, the results of radio metering of the interplanetary space vehicle «Viking», directed to Mars in 1975, showed Earth's shift towards the Sun about 30-40 meters a year and Mars more than 100 meters. An attempt to explain the phenomenon by assuming the birth of additional material within the planet runs into considerable difficulties, as it does not seem possible to explain why and how an additional material is born within the planet in terms of existing scientific belief. The described discovery naturally explains the experimental results obtained during the expedition of Viking to Mars.

Consequence of reduction of planet's orbit is reduction of period of its circuit around the center body and acceleration of its apparent motion. In case of intersecting orbits, for instance with a comet or asteroid, it may lead to a situation when both cosmic bodies happen to be in the same moment of time in an intersecting point with time. The law of secular planet shift makes it possible to predict such kind of occurrences.

For the Earth, no less important consequence of the reduction of its orbit (secular ap-

proach to the sun) will be an inevitable increase of average temperatures on its surface (secular warming).

#### References

1. Yavorsky B.M., Detlaf A.A. Guide in physics. – M.: Science, 1974. – P. 81–84.
2. Pukhov S.N. Quantum theory of gravitation. – Vladimir, 1995.
3. Pukhov S.N. Quantum theory of gravitation and aether, Problems of natural sciences at the turn of the century, Collection. – St.-Petersburg, 1999.
4. Loitsyansky L.G. Mechanics of liquid and gas. – M.: Science, 1978. – P. 95.
5. Publishing house Kaleidoskop // weekly UFO. – St.-Petersburg. – 16.08.1999.
6. Prussov P.D. Physics of aether. – Nikolaev, 2000. – P. 287.

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*Materials of Conferences***THE PSYCHOLOGICAL HEALTH,  
AS THE FULL – VALUED HUMAN  
FUNCTIONING CONDITION**

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At present, the large – scale researches conducting on the population psychological health challenge in our country is, ever more, the most actual one. The people existence conditions quick and the sharp changes are being undergone, because of the already developed social and the economic crisis. So, the unemployment is being grown up; the social mentality, the way of the human life, and the nourishment character are being changed. Practically, it quite possible to be observed the mass culture shock manifestation, as literally, the all our population, as soon as possible, has already been removed from the usual environment just into the new, the quite different, the unknown and also the anxious one, not having had the clear – cut landmarks medium.

That psychological phenomenon, which is being meant in the literature, as the identity crisis is being acted at the population considerable part in the contemporary period by our society changes under the survived conditions: «... this kind of notion is meant oneself feeling loss, the impossibility (or the difficulty) to be accommodated themselves to their own role in the already changed society. The identity crisis is being defined by the break – off between the constantly changing social and the economic relations demands and also the quite explainable rigidity of the personal attitudes, and the human behavior and the conduct stereotypes under our to – day's social conditions».

So, the unfavorable changes in the psychological health presentation have been registered the following ones, for the most part, in the contemporary period of the time.

Firstly, the considerable number growth of the neuropsychic diseases is being taken their place, and, first of all, those, that are the most character and the most typical reaction for the psychological stress. These are, in the first place, the neuroses, the post – traumatic stress disorder (or the combat fatigue), the psychosomatic disorders, the character and the pathocharacter reactions, and also the reactive (or the psychogenic) psychoses, the pathocharacter development, the personality's deprivation development.

Secondly, the negative socio – cultural and the other, having considered here, factors are being resulted in the more frequent exacerbation, the unfavorable course of those mental and the psychical diseases, the main cause of which is, for example, the hereditary predisposition to (e.g. the schizophrenia, the manic – depressive psychosis, the epilepsy and the others). At present, the hardships and the difficulties are being appeared, let us say, with the medicinal provision of the number of the mentally and the psychically patients' categories (e.g. overwhelming majority from them are living not too wealthily) and also with the arrangements realization on the social rehabilitation, and the psychocorrection.

And the third effect, having registered in the population psychological health presentation, is being consisted in the unhealthy worries and the anxieties content alteration and the further modification.

So, the main human activity, as the complex living system, is being regulated at the different and the various levels, which are being interconnected between each other. That is why, in this connection, the most general levels, which are the following: the biological, the psychological, and the social ones are being singled out. At the every level, which has been marked out just now by us, the human health has its own peculiarities and the specific determinants. At present, let us draw our attention from the human health peculiarities and the specific features, having connected with the biological malfunctions or the time – zone diseases, as the medicine eparchy – is here. Though, we have already above – marked, many diseases, having had the biological basis, never the less, are being connected with the mental stress and the psychical intensity, the anxiety, the stresses and etc. (for example, the ischemic heart disease, the gastric ulcer, and the other psychosomatic disturbances). Let us pay our special attention to the psychological health analysis.

For many years, the human psychological health has been considered only in the framework of the medical science – the psychiatry and the neuropathology, which have considered, and they are continued to be considered them, as «the spiritual applications» to the corporal breakdowns, or as the world's imperfection consequence.

As it is well – known, the quite another approach commence to the psychological health comprehension had been laid by Z. Freud, who comprehended many mental disorders and the psy-

chical disturbances, as the intrapersonal conflicts consequence, which are worried even the healthy people. He, moreover, has supposed, that the whole spectrum of the negative emotional worries and the anxieties (e.g. the depression, the anxiety and etc.) – is these conflicts subjective side, having appeared at the targets mis-coordination, which the man is put just before himself, and their achievement means.

Thus, the consequence of this, in the last decades, the human psychological health has been become the research and the study subject, and also the other sciences on the man and the society, and, first of all, the psychology. So, the human psychological health is being connected with the personality's peculiarities and the specific features, having integrated all the aspects of the human internal world, and they are quite able to be united his external manifestations into the comprehensive whole.

Thus, the psychological health is the significant component and the constituent part of the human social self – feeling, on the one hand, and all his living and the vital forces, on the other hand. At the same time, many challenges, having appeared at the man, are not quite mental poor health and the psychical indisposition index, and they are quite able to be decided by the other, the non – medical way (e.g. the memory, attention, and the thinking improvement; the communication necessary level formation; the self – presentations; the tendency and the intension to all his possibilities realization; the intrapersonal and the interpersonal conflicts solution; the release from the worries and the anxieties, from the stresses, from the frustrations, from the mental and the psychical dependences of the different types and the others).

At the same time, we suppose, that the psychological health is being determined by the balance peculiarities and the specific features, the human living and the vital forces harmony (e.g. in the individual and the social subjectivity indices) and also the living space originality.

Such kind of approach is being resulted in the quite different psychological health criteria. It is being provided the personality choice and the autonomous development possibility, just from all these positions. The following aspects are being related to its mechanisms: the self – knowledge, the ability to the solutions acceptance in the future direction, the readiness for the changes and the possibilities the alternatives to be singled out, the tendencies, to research and to use their own resources efficiency, to bear the responsibility for the performed choice and etc. On the subject of this, V. Frankle wrote, that, if the man

wants to come to himself, his way is laid through the world.

So, the psychical equilibrium phenomenon is one more psychological health criterion among its evidence numerous indications. It is being included in the personality different and the various spheres interaction harmony – the emotional, the volitional, and the informative, the educational, and the cognitive ones. Its disturbances and the disorders are being resulted in the personality degradations, in the destructions, in the social and the personal deadadaptation and the maladjustment. Exactly, the psychical equilibrium phenomenon is being connected with and the personality integral development, his or her adaptive possibilities and the qualities, their reactions adequacy upon the external influences. The phenomenon, having considered by us, is being considerably defined by the integration processes specific character just in the personality structure. Thus, it is being considered, that the psychological health is quite able to be corresponded to and the diverse and the various events integration level of his or her life, his or her subjective experience and the world pictures, having formed personally and the general social systems number, in which the man is being included in. A.G. Asmolov has named it by his or her personality building – meaningfulness; V.A. Petrovsky – by the convergence in the reflected subjectivity structure; G.S. Abramova – by the living consciousness; F.E. Vasilyuk – by the over – situational meaningfulness. The psychological health disorders and the disturbances are not always being defined by the mental and the psychical disease, and they are being connected not only with the human organism change, but and with the personality development conditions absence, his or her inclusion into the society social structure.

The human psychological and the social health differentiation is rather conditionally, as the personality qualities and the characteristics are being developed just only in the socium, in the society, in which he or she has been included. So, it is quite possible all these personality peculiarities and the special features to be described through the individual and the social subjectivity manifestations. So, we would remind you, that the personality analysis, as the individual, well as the social subjectivity is quite be able to be given more fully his or her characteristic for his or her psychological health.

All the above – mentioned material is quite allowed to be considered the psychological health, as the individual ability measure to support, to realize, and to develop the individual and the social subjectivity just in the constantly changing world,

and also the social health, as the active and the autonomous living and the vital forces maintenance and the development measure by the personal and the social subjects at the constantly changing living space, as the personal perception peculiarities and the special features and the social inter-eventful relations acceptance aggregate.

All the above – mentioned scientific facts and the thoughts peculiarities and the special features of the separate scientists and the scholars have already become the material basis, that the presentations on the psychological health multi – levelness are being developed in the contemporary psychology. So, the data are the approach such basis on the fact, that the psychological health top level is being connected with the adequate personality production of the meaning orientations, the life general meaning, the life strategies, the relations to the others, to himself or herself definition – and this is being had the regulating influence upon the underlying levels. In the similar way, the comprehended psychological health is being supposed the quite different and the various levels complex interactions presence, and it, moreover, is not able to be defined through the following: «balance»,

«compensation», «stability», and «adaptation» notions. So, the «positive psychological health» conception is being connected with the activity peculiarities and the specific features, and also with the personality development. This kind of the approach is being resulted in the psychological health criteria definition, having characterized, to an even greater degree, the process itself, than the state. Then, the psychological health disorders and the disturbances are not always connected with the mental and the psychical disease, during which the adaptive function is being disturbed, but, for all this, the personality development is not being stopped. Thus, the above – indicated approach just to the psychological health is being declared it not as the conflicts and the challenges absence, but as the personality self – regulation mechanisms maturity, the safety, and the activity, having provided the necessary full – valued and the human functioning.

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*Materials of Conferences*

**THEORETICAL PRECONDITIONS OF  
NEW KINDS OF NUCLEAR PROTECTIVE  
METAL COMPOSITE MATERIALS  
DEVELOPMENT BASED ON FERRIC  
AND BISMUTH OXIDES CAPSULATED  
INTO METALLIC ALUMINUM MATRIX**

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Nowadays there are topical tasks in the nuclear protective building materials science for working out new kinds of materials with high nuclear protective and strength characteristics, efficient under conditions of dynamic, alternate temperatures and combined radiation loads, resistant to high repeated temperature drops.

Such materials can be presented by composite materials combining plastic metallic skeleton (aluminum, lead, copper, tin etc.) and solid metallic and nonmetallic reinforcing components both of natural and artificial origin (granite, basalt, limestone, dolomite, quartzite, marble, metallurgical slag, ashes, expanded clay, ferric oxide systems and others) [1]. Particularly, there is a practical interest to elaboration of the metal-composite material based on highly dispersed ferric oxides (magnetite, hematite) and bismuth oxide capsulated into metallic aluminum matrix.

The use of ferric oxide fillers will allow to increase physico-mechanical and nuclear protective properties of the composite (resistance to high-energy fields of  $\gamma$ -radiation impact); bismuth will enhance the ability to scatter heat neutrons almost without absorption; aluminum matrix application as a binding agent would give unique properties of aluminum: high degree of workability (the material will be well pressed and can take plastic deformation), elevated heat conductivity and ability to reflect heat flows.

On my opinion, further development of scientific aspect of elaboration and manufacture of such metal composite materials and, as a consequence, the design of modern nuclear protective engineering constructions on its base would play a great role in the field of nuclear protective building materials science.

#### References

1. Boldyrev A.M. Resource saving technologies of metal-concrete building composites production / A.M. Boldyrev, A.S. Orlov, E.G. Rubt-

sova // Construction Proceedings. – Belgorod: Publisher NSACU, 2002. – №4. – P. 38–43.

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**THE IMPROVEMENT OF STAINLESS  
STEELS MACHINING PARAMETERS  
AT THE USE OF CUTTING WITH  
ADVANCED PLASTIC DEFORMATION**

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The improvement of stainless steels machinability is an important problem of the contemporary engineering. Learning nature of physical processes in the zone of cutting gives opportunity to change and manage the parameters of the machining. One of the methods of efficient improvement of metal machining is cutting with advanced plastic deformation (APD).

Cutting with APD concludes in combination of two processes – surface plastic deformation, creating necessary depth and extent of work hardening and consequent removal of the hardened metal in the shape of facings. Thereby there are created conditions, promoting the improvement of firmness of the cutting instrument and the quality of work.

The research was undertaken for a turning cut of austenitic stainless steel 12X18H10T (according to State Standard GOST, Russia) at semifinishing and finishing modes in a wide range of cutting speeds. The cutting instrument was presented as wolframium-cobalt, wolframium-titanium-cobalt, wolframium-titanium-tantalum-cobalt, non-wolframium carbide blades. The measurements of unevenness were done and profilograms of the finished surfaces were written down, the runout of the back age of the carbide blade and other parameters of the cutting process were fixed. The depth of advanced hardening, created by knurling group was chosen according to the depth of cut-

ting. Aim of the research was to find out character of APD influence on formation of unevennesses of the finished surface and on runout of the cutting instrument.

Analysis of the experimental data, obtained for different machining mode combinations, showed that unevenness after cutting APD is less than after traditional cutting. When using the experiment method not only modulus of center-line-average surface finish  $R_a$  (mkm) occurs. When cutting with APD this parameter of quality corresponds to finishing work, and when using traditional cutting at the same modes (speed and depth of cutting, supply) – semifinishing. That means that in some cases the method allows reducing quantity of technological transits, necessary to get the required level of unevenness. Positive impact of APD is also proved by profilograms of microasperities of the finished surfaces (height of microasperities of the surfaces finished with APD is lower and their profile is more stable). Reduction of rates of wear of cutting blades while finishing with APD was fixated.

Formation of unevennesses of the finished surface and runout of the cutting instrument are defined by the character of interaction of cutting instrument, forming facing and the finished surface. Processes in the zone of cutting (zones of contact interaction and formation of facings) are determined by temperature-deformation principles of high-speed plastic deformation. Except mode parameters of fulfilling the finishing, simultaneous interaction of features of instrument and finishing materials, subject of conditions, forming mechanisms of contact interaction and stipulating change of types of facing formation, is considerably determined by mechanical and thermophysical characteristics of the finishing material. Mechanical (firmness, strength, ductility) and thermophysical (thermal conduction, thermal capacity) features of steel determine intensity of heat output and heat outflow in the zone of cutting, load on cutting wedge of the instrument, change of types of contact interaction. While finishing with APD resistance to deformation and parameters of heat output in the zone of cutting should differ from the case of traditional finishing and consequently conditions of separation of metal of the cut layer and finished surface and conditions of contact interaction should change. Change of the features of the hardened metal should provide more favorable conditions of contact interaction to reduce intensity of runout of the cutting instrument and getting less unevenness of the finished surface.

Thus, cutting with APD is an effective method of workability of stainless steels. In a num-

ber of cases reduction of unevenness allows reducing quantity of necessary technological transits, and by that improving efficiency of the finishing. Reason for such influence of APD should be favorable change of process parameters in the zone of cutting.

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#### **COMPLEX AND RATIONAL USE FISH RAW MATERIAL AT PRODUCTION OF THE FISH PRODUCTS**

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There was developed resource saving technology of herring preserves, which allows to rationally use raw, to cut lasting of the technological process, to lower the production costs and rise the economical effectiveness of production. There were defined the optimal conditions of getting broths of herring wastes. There were developed the recipes of fills at the base of broth from collagen-containing wastes of herring with the addition of vegetable raw.

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Preserves of aquatic are delicacy products, which are always demanded by consumers. While the production of reserves the taste, the smell and consistence, which is peculiar to ripen salted fish, form while the salting because of the processes of hydrolysis of protein and lipids of muscular tissue, oxidation of lipids and reactions of synthesis between them. At the same time there is universally recognized the fact of inhibition with sodium chloride of the process of biochemical ripening of salted fish (introduction of the salt leads to the slowdown of ripening). There was developed the resource saving technology of preserves from herring, which allows to rationally use the raw, to shorten the lasting of technological process, to lower production costs and rise economical effectiveness of production [1].

The use in the fish production of deep cutting of fish leads to the forming of collagen-containing wastes (skin, fins, bones), which are reasonable to use for getting fish broth. Introduction of such technologies into the production allows not only to spread the assortment of food products from hydrocoles, but also to solve actual problem of rising of level of food use of extracted

raw, which is priority at the development of fish sector of Russia.

The aim of the work is the development of technologies of preserves from the Pacific herrings at the gel fills from the collagen-containing wastes. According to the stated aim there was foreseen the solving of the following tasks:

- study of influence of the different technological factors (type of the environment, lasting of the thermal treatment) on the behavior of broths from collagen-containing fish wastes, their gelling ability; explanation of the optimal conditions of getting fish broths;
- development of recipes f fills from the collagen-containing fish wastes;
- development of technology of preserves with the use of the new way of ripening in the different sauces.

While the thermal treatment of herring wastes the collagen in the form of gel substances passes into the water environment, forming the broths of different concentration. The hydrolysis of collagen into a water environment depends on different technological factors: temperature, lasting of thermal treatment, pH medium [2, 3, 4]. The researchers founded the optimal correlation of the water and fish wastes, which is 1:1, the optimal temperature of hydrolysis– 100°C. While this regime the broths have the best showings of kinematic viscosity and mass fraction of dry substances [2, 3].

We have carried out the researches by the use as the water environment for the hydrolysis of the collagen from the herring wastes of curd whey (pH 4,7) [4]. The results of the experiment showed that broths, received at the base of whey, have more viscosity, higher temperatures of melting and gelling, than broths received from water (table 1).

**Table 1**

Physical behavior of broths from the herring wastes

Showings	Fish broth out of curd whey				Fish broth out of water			
	Lasting of hydrolysis, min							
	15	30	45	60	30	45	60	75
Temperature of gelling, °C	5,0	5,0	2,0	-	1,0	1,0	1,5	1,0
Temperature of melting, °C	8,0	6,0	4,0	-	1,0	1,5	3,0	1,0
Contents of dry substances, %	11,8	12	12	12	5	7,5	8	8
Kinematical viscosity, mm <sup>2</sup> /s <sup>2</sup> (while the temperature 6°C)	0,42	0,52	0,45	0,45	0,32	0,32	0,38	0,38

We have observed that for getting of galantine out of fish broth at the base of curd whey the optimal lasting of hydrolysis is 15 minutes and 30 minutes (table 1). While the longer lasting of hydrolysis the temperature of gelling is very low. Received facts give proof of the possibility of use broths from the herring wastes at the base of curd whey as the surface-active media while the production of emulsion products. At the result of research we have stated the optimal regimes of hydrolysis of collagen from the herring wastes while the use of the curd whey as the water environment: correlation of wastes of curd whey is 1:1, temperature of hydrolysis is 100°C, lasting of hydrolysis is 15 minutes. While the use of this broth there is got the emulsion with the thickest consistence.

The use of curd whey for getting fish broths is reasonable, because while this there is shorten the lasting of hydrolysis of collagen, what leads to the lowering of the production wastes. Besides, broths at the base of whey are notable for less expressed fish smell.

At the base of broths for the Pacific herring wastes, prepared with the use of curd whey, there were developed the recipes of sauces with the addition of sea cabbage and fern.

Thereby, in the result of researches there were defined optimal conditions of getting of the fish broths and influence of the different technological processes on their gelling behavior; there were developed the recipes of sauces at the base of the broths from the collagen-containing herring wastes; there was developed the technology

of preserves from herring in the different sauces, which are enriched with the vegetable raw and curd whey.

#### References

1. Bogdanov V.D., Saltanova N.S. Technology of salted pre-ripening herring // Fishing industry – 2005. – №1 – P. 64–65.
2. Bogdanov V.D. Fishing products with the regulated structure. – M.: World, 2005. – 310 p.
3. Bogdanov V.D., Safronova T.M. Builders and fishing compositions. – M.: VNIRO, 1993. – 172 p.

4. Chernega N.V. The development of technology of multicomponent canned food in the gel fills from the collagen-containing fish raw: Autoref. Dissertation of the candidate of technological sciences. – Stavropol, 2006. – 24 p.

---

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## Short Reports

UDK 661.8

**POSSIBLE INFLUENCE OF POTASSIUM CHLORIDE ADDITIVE ON THE PROCESS OF FORMATION OF SPINEL  $\text{NiFe}_{0.8}\text{Cr}_{1.2}\text{O}_4$** <sup>1</sup>Talanov V.M., <sup>1</sup>Shabelskaya N.P.,<sup>1</sup>Ulianov A.K., <sup>1</sup>Golovina A.G.,<sup>2</sup>Reznichenko L.A., <sup>2</sup>Talanov M.V.<sup>1</sup>South Russian State Technical University  
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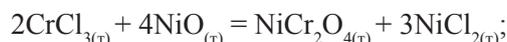
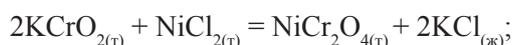
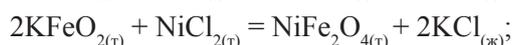
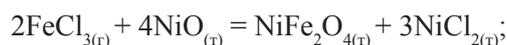
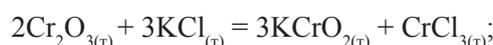
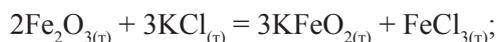
Traditional methods of getting spinels (solidphase mechanism from oxides of the appropriate metals) usually run with high temperatures and demand long heat treatment which is conditional upon not fast reactions. One of the methods of making such solidphase reactions faster is introduction of small additives of alkali metal halides into reaction environment. Aim of the research is study of influence of additive KCl on the process of formation of spinel  $\text{NiFe}_{0.8}\text{Cr}_{1.2}\text{O}_4$ .

Material of the given composition was obtained with the help of ceramic technology.

At a temperature of 1100 °C of heat treatment the process of formation of spinel structure takes 90 hours.

In the process of ongoing study synthesis of substances was carried from the oxides of nickel (II), chromium (III), iron (III) with the addition of potassium chloride. The starting materials were homogenized in an agate mortar for one hour with ethyl alcohol in the air, pressed into tablets and heat treated for 4–5 hours at a lower temperature. The completeness of spinel formation was controlled by X-ray phase analysis.

According to information in literature [1], introduction of alkali metals halides into the mixture allows synthesis at lower temperatures. It was marked that the effect from introduction of the additive is decrease with increasing temperature of heat treatment over 800 °C. As a result of the undertaken study it was found that the process of spinel formation at temperature 950–1050 °C is more complete. Explanation of the experimental fact may be given with regard of influence of gas phase, formation of which is possible in the course of the following reactions:



In the process of structure formation there were involved both ferric chloride (III) and nickel chloride (II), which is apparently the reason of a more complete reaction of spinel formation at higher temperatures. Formation of gas phase during the reaction takes, apparently, the process from diffusion sphere into kinetic one.

**References**

1. Chervinko A.G. Influence of halogen anions on the process of formation of oxides of zinc ferrite // Chemistry and chemical technology. – 1972. – T. 15, № 12. – P. 1831–1834.