CONTENTS

INVESTIGATION OF REPRODUCTION AND SELECTION POTENTIAL OF HOLSTEIN BREEDING CATTLE IN KYRGYZSTAN

Mamatov N., Karabaev A., Chekirov K.
Kyrgyz-Turkish Manas University, Bishkek, e-mail: nurmamatov1965@mail.ru

In this article, statistical results of selection characteristics and milk yields, live weight and reproduction characteristics of Holstein sheep breeds grown in Kyrgyzstan conditions are given according to their origins and ages. Parameters were calculated for milk yield and growth characteristics. For this purpose milk productivity, lactation and live weights of cattle were measured. Holstein cows were crossed with local races to improve productivity during milk productivity and lactation. As a result, there are significant variations in some yields in the animals raised. According to the results obtained, the live weights of Holstein cows raised in Kyrgyzstan were 505.4 kg, the first lactation milk yield was 4641.9 kg, the second lactation was 5082.4 kg and the third lactation was 5127.1 kg. In the same order, service period lengths were obtained as 119.2, 101.5 and 96.4 days. The coefficient of variation for the lactation yields was calculated as 6.04% for live weights and 13.13, 14.78 and 17.47 for lactation milk yield, respectively. This coefficient was 38.82%, 40.10% and 54.41% in terms of reproductive characteristics, respectively. It can be understood from these figures that it is understood that there is possibility to make progress by making selection in this herd. The results are presented in tabular form. Since Kyrgyzstan is a mountainous country, native animal breeds have also been adapted to these conditions. Local animal breeds have also been selected and raised by native scientists. Local races are grazed in the mountains and for this reason they have become adherent to harsh weather conditions. As a result of this article, it was determined that there is a significant variation in terms of breeding and milk yield characteristics and this is the result that can be evaluated in Holstein breeding in Kyrgyzstan.

Keywords: Holstein Race, Herd Parameters, Breeding Characteristics, Milk Yield

Animal husbandry of Kyrgyzstan has a leading meaning in the agriculture sector. Because it constitutes more than half of the income earned. One of the main ways to increase the efficiency of dairy cattle breeding is targeted at the improvement of existing and creation of new, more productive and efficient livestock. Taking into consideration that at the present time, the world's Holsteins breeds appreciate and characterize not only as the most milk productive, but also as the most technically advanced that is like no other breed meets requirement to widespread use of mechanization and automation of milking cows, as well as taking into account the extremely high rate of Holstein cattle population growth and productivity in many countries around the world including in Kyrgyzstan. It was initiated purposeful crossbreeding of local breeds of cattle with Holstein bulls to develop new more productive genotypes of black and white cattle. Since 1981 on the farm of Open-Joint Stock Company "MIS" made breed improvement best dairy breeds in the world: Holstein-Friesian Black Pied, Holstein-Friesian Red-and-White, Anglo-Frisian, Dutch, Swiss American selection, Ayrshire, on the identification of adaptation to local climatic conditions and obtaining the highest milk production [1]. Also imported pure-bred cattle from the Kaliningrad region, Germany and Lithuania. Thus, it conducted thoroughbred breeding Holstein-Friesian and absorbing cross Alataoo cows in Kyrgyzstan. At the moment genealogy herd structure is the world lines of Holstein bulls, widespread in all climatic zones of the world. The most important breed in breeding milk is the breeding line of Holstein cattle [1]. These many breeders suggest a favorable influence on important Holstein breeding traits as the value of milking cows and suitability to machine milking [2–5]. Implementation of genetic potential to the productivity of cattle imported from foreign selection is possible, provided that the same or better conditions, as well as improved housing and feeding technology will be created for these animals [6, 7]. Therefore the aim of this study was the analysis of the main indicators of selected features productivity Holsteins bred in Kant of MIS based on age and origin.

Materials and methods of research

The objects of research were the cows of Holstein breed, bred in different lines of breeding farm in Kant. Experimental animals throughout the experiment were clinically healthy, were in the same conditions and fed. Milk productivity evaluated by milking during 305 days of lactation or whole shortened lactation [3]. Also assessed the quality indicators of animal milk. As an indicator of the reproductive capacity of the service period studied by analyzing accounting data animal pedigree certificates. In determining the selection and genetic parameters of selected attributes calculated: arithmetic mean (X) and its error (mx), variability, expressed as a standard deviation (σ) and coefficient of variation (CV). By the mathematical processing of experimental data and analysis of breeding and genetic parameters used conventional methods of variation statistics[4].

Results of research and their discussion

Productivity – the main economic feature of farm animals, and therefore it is the basis of all methods of selection on complex traits [6]. The animals were taken in terms of productivity, taking into account the variability of quantitative and qualitative indicators. The level of milk productivity is not only dependent from the breed, but also from individual animal within a breed. In any herd cows are more or less productive, and this diversity is the best selection for positive animals [7].We studied milk productivity in 63 cattle on the farm and the basic statistical parameters. The level of milk production at the cow of Holstein breed at the MIS farm varies greatly. The simplest measure of variability of this trait – a limit value that is the absolute different between the maximum and minimum values of the trait (min-max)). In this case, the animals examined levels of milk production limit is: 1. lactation 3395 (6405–3010) kg, 2. lactation 4940 (7310–2370) kg, 3.lactation 3117 (4869-7986) kg. It speaks of a very wide range of variability of this trait [8]. For a more complete study of the degree of expression and the variability of use were calculated and other statistical parameters of averages and variability. The data obtained are demonstrated in Table 1.

Table 1

Average live weight and milk yield, standard deviation and coefficient of variation of Holstein cows (n = 66)

Main breeding features	Statistical parameters		
	X + mh, kg	σ, kg	Cv, %
Live weight, kg	505,36 ± 3,76	30,55	6,04
Milk production for first lactation, kg	4641,89 ± 75,01	609,37	13,13
Milk production for second lactation, kg	5082,39 ± 92,47	751,20	14,78
Milk production for the third lactation, kg	5127,05 ± 111,11	895,83	17,47

Table 2

Milk and fat yields of daughters in first lactation according to Breeder's Bull

Name of the bulls	Place of the birth of bull producer	Number of daughters	Productivity of daughters		Live weight	Productivity of mothers	
			Milk	Fat		Milk	Fat
Durman 361	Russia	1	4194	3,94	465	4156	4,01
Estamp 776	Russia	36	4274	3,96	485	4172	3,86
Bellfast 5032	Switzerland	19	4289	3,96	480	4339	3,92
Marvud 2293604	USA	20	4352	3,97	500	4119	3,92
Santal101	Canada	6	4628	4,04	485	4189	3,89
Lido23677	FRG	7	3903	3,04	475	4007	3,83
Caffe3481	Israel	14	4292	3,97	475	4412	3,92
Herzog 119	Canada	5	4450	3,87	454	4534	3,81
Atlas 7032	Switzerland	20	4612	3,95	475	4359	3,93
Craft 66270	Canada	10	4757	3,91	495	3858	3,95
Europio 92012	Italy	23	4588	3,91	495	3858	3,95
Insbruk 5539	Canada	10	5180	3,94	495	4341	3,85
Lin 482495	England	6	4301	3,9	485	4416	3,95
Persuader 13064124	FRG	5	4973	3,91	500	5358	3,81
Patsil 3421	Israel	14	4161	3,91	485	4350	3,92
Choice 30634	USA	1	3717	4,1	495	4843	4,09
Shammi 1029	Italy	1	4143	3,83	500	5074	3,78
Avsha3651	Israel	21	4810	3,9	475	3997	3,83
Total		251	4411	3,95	484	4195	3,77

According to the data from Table 1 shown that the average yield on the study group (n = 66) Holstein cows on the first lactation is 4641, 89 ± 75, 01 kg and there is a gradual increase in the 3-and lactation is 5127,04 ± 111,11 kg and the difference in milk production between 1st and 3rd lactation was 486 kg. Also, an increase in the coefficient of variation, cow on the 3rd lactation has a very high level of variability of this trait – coefficient of variation 17.47% [19]. Shown productivity from bull producers and amount of milk with fat content. The origin of the bull producers which is very important for consideration in Table 2.

The main factor affecting milk production is forage quality. In recent years there has been a downward trend because of the non-harvesting time, violations of the harvesting technique and storage technologies [9]. The result of this economic activity becomes lower total nutritional and palatability of feed animals, a chronic lack of protein and energy in the diet and a sustained reduction of the synthesis of milk cows in the body [8]. Also currently farming experts pay great attention to the study of reproductive function in cattle, since violations abnormalities cause great economic damage to farmers [10]. In connection with the introduction of artificial insemination to animals become important Bulls score on fertility [9]. The important role played by hereditary reproductive function of cows, their fertility. The reproductive capacity of animals affected by external factors (feeding, housing system, season of the year, and lighting) At the same time it is largely due to heredity [11]. Sexual maturity occurs in heifers at 18 months. Reproductive function greatly depends on the state of the endocrine system, which is genetically determined. The synthesis of hormones that affect the formation and development of the reproductive function is due to genetically at the molecular level [12]. One of the indicators of reproductive ability in the cattle is a service period – the time interval from calving to productive mating. According to many researchers and an optimal duration of the service period is considered to be 60–90 days [12]. In order to study and determine the statistics service period of our sample is composed of 66 pedigree breeds Holstein at MIS farm. Average indices and indicators of variability service period of cows of Holstein breeding in MIS farm are demonstrated in Table 3.

Analysis of the data table shows that the duration of the service period of the studied animals is very variable. In many cases, the duration of the service period exceeding 100 days. There are also animals with the duration of the service period of over 200 days. In rare cases, the animals found with a service period of at least 40 days [13]. The reason for the duration of the service period, in this case, apparently, due to the low fertility of cows, as well as the duration of the lactation period, i.e. in this case, the cows do not start on time [14].

Analyzing the average duration and variability in service time Holstein breed cows shown it can be noted that there is a tendency to reduce the duration of the service period of the sequence with increase of calving. So the animals after 3 calving had an average duration of the service period of 96.4 days, which is closer to the optimal index. The highest duration of the service period, discovered in animals after 1.calving (119.21 days) [16, 17]. It should be noted that the variation of the trait (the coefficient of variation CV) in the studied animals are very high and amounts to 38.82, 40.1 and 54.31%, depending on the order of calving [18, 19]. Maintenance and breeding of animals with a high duration of the service period is not economically feasible, as in this case increases the cost for the maintenance and care of animals and the diminishing returns of products [19, 20].

As it's known, the value of milking cows depend on the conditions of feeding and maintenance, by heredity, level of exploitation of animals and the level of breeding work on the farm. To increase milk production and a fuller realization of the genetic potential of Holstein animals need to improve the content and provide a stable balanced feeding, and also to introduce a modern method for assessing the breeding value of the animals and the import of animals and sperms of better quality [21, 22].

Table 3

The average values and variability of the length of service period in Holstein cows (n = 66)

Priority service period	Statistics days		
	X ± mh,	σ, days	CV,%
Service period after 1st calving	119,21 ± 5,70	46,28	38,82
Service period after 2nd calving	101,48 ± 5,01	40,69	40,10
Service period after 3rd calving	96,4 ± 6,76	52,35	54,31

As a result of this article, it was determined that there is a significant variation in terms of breeding and milk yield characteristics and this is the result that can be evaluated in Holstein breeding in Kyrgyzstan. Significant variations were obtained when appropriate bull sperms were selected according to average milk yield, live weight and reproduction parameters. When they are selected according to their selection criteria and evaluated according to 2 or 3 frosting yields, it is concluded that Kyrgyzstan can be used as an important selection criterion in dairy cattle breeding.

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ANTHROPOGENOUS IMPACT ON SPECIFIC STRUCTURE OF THE COLCHIS WOOD AS A PART OF FLORA OF THE CAUCASUS

Skipina K.P.

Sochi institute (branch) of FGBOU VPO "Russian university of friendship of the people", Sochi, e-mail: skipina1@yandex.ru

Subtropical plants of the Black Sea coast of the Caucasus – the most northern region with subtropical climate, are characterized by a big specific variety. The specific variety of the Black Sea subtropics which created exotic southern vegetation of the Black Sea coast of the Caucasus under anthropogenous influence becomes a source of enrichment of specific structure and natural flora of the Caucasus.

Keywords: flora of the Caucasus, Black Sea subtropics, introduction, anthropogenous influence

The nature of the Black Sea coast of the Caucasus from the nonfreezing Black Sea to spurs of Greater Caucasus Range between Novorossiysk and Batumi is peculiar in many respects.

Landscapes of this region arose under the influence of the mountains protecting the coast of the Black Sea, from the continental norths providing preservation of heat and moisture, accumulated by the sea in a zone of the coast [7]. The unique combination of climatic and soil conditions of the area, from the river Psou to a river basin of Shepsi is favorable for growth of subtropical plants in a coastal zone and on some sites of a foothill zone [1].

The environment which provided formation of unique landscapes of a subtropical zone of Krasnodar Krai is favorable for vigorous economic activity of the person. Anthropogenous influence on transformation of structure of flora of the region began with an introduction of plants during development of these territories in the second half of X1X century.

During quite long period of an introduction on the Black Sea Coast there were about 5000 species of subtropical plants, new to the region, among which there are even representatives of tropics [1, 5].

Ecological characteristics of the region left an option behind those types which biological features corresponded to climatic conditions of Black Sea Coast. From the morphophysiological point of view their number, first of all, included the plants capable in this combination of ecological factors to reach blossoming with formation of full-fledged seeds. Quantity of types wood and shrubby the introduced species which reached full acclimatization in the conditions of Black Sea Coast it is rather great. Almost 150 years' experience of an introduction of species of trees and bushes on the Black Sea coast of the Caucasus promoted creation of unique landscapes of a park zone of this natural greenhouse [1, 5]. As a result, an exotic specific variety of introduced species is successfully combined with representatives of the Caucasian wood as component of this park and green space.

Along with the solution of problems of expansion of specific structure of park plantings, botany and ecologists together with workers of forestry of the region carried out work on enrichment of the green space of Black Sea Coast by representatives of subtropical flora from assortment of park vegetation [4]. Methods of expansion of areas of representatives of cultural flora of the coast were as a result offered and applied in practice of forestry. As a result of acclimatization of the plants attracted to gardening of park territories the specific structure of forest parks of the region was replenished.

It is necessary to carry representatives from North America and the Mediterranean, China, Japan, the Himalayas and Mexico to their number. The highest extent of acclimatization reckon wood and shrubby plants of east and western parts of North America [4]. The majority of views of this continent are of interest to the forest parks of the region having both decorative, and silvicultural value.

A significant amount of views of East Asia, China, Japan, the Himalayas also well adapted for local conditions. Many of them with success are used for expansion of a specific variety of forest parks of Black Sea Coast.

Quite successfully plants of the Mediterranean flora acclimatized and are of interest to enrichment of the local green space valuable breeds.

Researches of views of the Southern American, Southern African continents, and also the Australian and New Zealand types showed that, giving appeal to city parks and squares, they aren't of interest to forest parks on a number of signs of ecological and economic value.

Complexity and strong compartmentalization of a relief, a variety of geological, soil

and climatic factors has considerable impact on nature of distribution of vegetation of Black Sea Coast. As well as in any mountainous area, vertical zoning in distribution of specific structure of vegetation here too takes place [2]. Therefore ecological approach to input of subtropical introduced species in structure of the developed phytocenosis of the region provided success of their inclusion in forest and forest-park massifs. However, as show supervision and analytical approach to evolutionary transformation of vegetable communities, artificial expansion of areas of distribution of the introduced species of plants not always becomes a source of their successful entry into vegetable community of wild flora of the region.

By consideration of evolutionary processes of formation of forest communities it appeared that as the essential moment of these transformations at the level of populations it is necessary to recognize restriction of opportunities of reorganization of their structure when settling of a number of biogeocoenosis by them. Discussing a problem of moving of types, new to the region, taking into account this point of view, it is obviously possible to offer an explanation for so insignificant entry into the developed phytocenosis of types, new to the region, [6].

The analysis of flora of the Sochi Black Sea Coast showed that in its structure 2105 species of wild-growing vascular plants, from 723 stems and 155 familys are registered. From their number of only 27 species of trees and bushes treat the overseas types and forms growing on the Black Sea coast [7].

As show data of dendrologists and our researches, ways of inclusion of new types to structure of local phytocenosis are caused by their biological properties, and also ecological and orographical conditions of the district [5].

The majority of the types which were a part of local vegetable communities have a North American origin and represent 9 species from six familys. From the Mediterranean, East and Central Asia their number included respectively four and six species from nine familys. By one view from seven familys widespread in China, and four types of three familys from Japan also were capable to reproduction and growth in nature without intervention of the person. Australia is presented in this list by one species.

Species of trees and bushes from among introduced species as a part of wild flora of Black Sea Coast

North American continent: *Amfora frutikosa Fam. Fabaceae, Vitis Iabrusca L. Fam. Vitaceae, Gleditsia triacanthos Fam. Fabaceae, Acer negundo L. Fam. Aceracea, Liquidambr styraciflua L. Fam. Hamamelidaceae, Juglans nigra L., Juglans regia L. Fam. Juglandaceae, Robinia pseudoacaciae Fam. FaЬiaceae, Diospyros virginana L. Fam. EЬenaceae, Philadelphus coronaries L. Fam. Hydrangeaceae.*

Mediterranean: *Acaceae julibrissin Durazz. Fam. FaЬaceae, Spartium juceum Fam. Fabaceae, Laurus nobilis L . Fam. Lauraceae, Ficus carica L. Fam. Moraceae.*

Central and East Asia: *Cidonia oblonga Mill. Fam. Rosacea, Hibiscus siriacus Fam. Malvaceae, Hibiscus trionum Fam. Malvaceae, Syringa persika L. Fam. Oleaccae, Morus alba L. Fam. Moraceae, Morus nigra L. Fam. Moraceae.*

China: *Ailanthus altissum (Mill.) Swingle Fam. Simaroubaceae, Paulownia tomentosa (Thun) Steud. Fam. Scrophulariaceae, Poncirus trifoliate L. Raf. Fam. Rutaceae, Trachycarpus ecselsa H.Wendl Fam. Palmaseae, Pyracantha coccinea Roem. Fam. Rosaceae, Pueraria lobata Fam. Fabaceae, Thea sinensis L. Fam. Theaceae.*

Japan: *Cerasus vulgaris Fam. Rosaceae, Elacagnus pungens Thunb Fam. Elacagnaceae, Eriobortya japonica Lindl., Sofora jaubertii Spach Fam. FaЬaceae.*

Australia: *Acaceae dealbata Zinn. Fam. Fabaceae.*

In the middle of last century when summing up studying of exotic plant of the wood and shrubby breeds which weren't growing earlier on the Black Sea coast of the Caucasus the opinion on possibility of enrichment of the local woods by valuable exotic planta by creation of uterine plantings by pure one-pedigree groups for receiving seeds of valuable wood exotic plant was expressed [3]. The task of artificial renewal of the woods with simultaneous replacement of minor breeds was set.

For the solution of this problem by artificial landings and crops of seeds ten species of valuable wood plants were allocated. So far from this list as a part of a phytocenosis of the Colchis wood the noticeable place belongs only to a type of *Paulownia tomentosa Stend*. Most likely, it was promoted by the birds extending seeds.

However, as showed our supervision, plentiful formation of full-fledged seeds not always provides moving of the population possessing this quality. The *Cedar Himalaya* which gives a large number of the viable seeds not capable to extend out of growth place limits can serve as an example. Thus, expansion of an area of such types is impossible without the aid of the person.

Studying of specific structure of the trees and bushes which took a certain place in subtropics of Black Sea Coast showed that extent of their moving is connected with biological features of a look. The success of occurrence of types in surrounding them фитоценоз without intervention of the person is defined by possibility of manifestation all inherent in this look the morphophysiological of signs in specific ecological conditions of the region. If to track ways of microevolution of phytocenosis against successions of forest vegetation, it is possible to anticipate possibility of inclusion of new types in forest communities in a certain degree.

So scales of distribution of the types forming edible fruits and seeds can be connected with possibility of their moving by means of birds. The plants breeding seeds ashkeys ensured active, and even aggressive, entry into structure of vegetable communities of a zone of Black Sea Coast. Ability to successful moving was shown also by the types possessing possibility of vegetative reproduction. *Pueraria lobata (Wild.) Obwi* и *Acaceae dealbata Zinn concerns to them*.

The analysis of dendrology, ecological and botanical researches allowed to reveal relationships of cause and effect which promoted acclimatization and transition of the introduced types to structure of natural phytocenosis of the Sochi Black Sea Coast.

Thus, subtropical plants of the Black Sea coast of the Caucasus – the most northern region with subtropical climate, are characterized by a big specific variety. The specific variety of subtropical types which created exotic southern vegetation of the Black Sea coast of the Caucasus under anthropogenous influence becomes the source promoting process of enrichment of a specific variety of natural flora of the Caucasus.

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EFFECT OF SYNTHETIC PYRETHROID DELTAMETHRIN ON GLYCOGEN CONTENT IN MUSCLES OF EXPERIMENTAL ANIMALS

Chigrinski E.A.

Omsk State Medical University, Omsk, e-mail: chigrinski@list.ru

Glycogen is a form of carbohydrate reserve in organism of mammals, including human. It can be accumulated in large amounts in liver and skeleton muscles. The basic purpose of liver glycogen is supporting glucose level in blood, and muscle glycogen is used only by muscles mainly in conditions, related to insufficient oxygen supply to these organs. A sufficient amount of glycogen in muscles allows animals to adapt to the changing conditions of environment. Scientific literature contains certain data on influence that various classes of pesticides can have upon glycogen contents in organs of different animals, including mammals. At the same time, information on glycogen concentration in muscles of mammals during recreation period after a single introduction of synthetic pirethroids in toxic doses is available.

The objective of this work is to reveal influence of deltamethrin upon dynamics of glycogen content in muscles of experimental animals during one month after a single introduction of the studied pesticide.

For experimental purpose we have formed 8 groups (n = 12) of 96 male rats of Wistar line with body mass 240 ± 10 g. Rats of groups 1, 3, 5, and 7 were control and received saline. Animals of groups 2, 4, 6, and 8 were exposed to a single introduction of deltamethrin into stomach in dose of 17,4 mg/kg of body mass that equals 1/5 L/D_{50}. In order to determine dynamic of glycogen content in muscles, animals were recovered from the experiment by stages: rats of groups 1 and 2 – after one day, groups 3 and 4 – after three days, groups 5 and 6 – after seven days, groups 7 and 8 – after thirty days. During the experiment deltamethrin form under trade mark "Butox 50" ("Intervet", Netherlands) was used. Requirements of European Convention for the Protection of Vertebrate Animals used for Experimental and other Scientific Purposes (Council of Europe No 123, Strasbourg, 1985) were followed during tests and in process of recovering rats from the experiment.

Glycogen was sampled in large thigh muscles according to the method of R.S. Carr and J.M. Neff, 1984. The received digital data was statistically processed with facilitation of Mann-Whitney test. Difference was considered statistically relevant for $p < 0,05$.

Statistical analysis has revealed significant difference in glycogen content between rats of group 2 in comparison to the corresponding control group, their values varied by 40% ($p = 0,0092$). This fact can be caused by neurotoxic effect of deltamethrin that can provoke excessive activation of nervous system that happens along with paroxysm, uncontrolled muscle contraction, and coordination disturbance. All these symptoms result in energy deficit and intensified consumption of muscle glycogen in ATP regeneration. After three and seven days past introduction of deltamethrin deficit of muscle glycogen has become less expressed, but statistically-relevant deviations from control groups remained. Glycogen content in muscles of rats in groups 4 and 6 was lower by 19,6% ($p = 0,0214$) and 19,4% ($p = 0,0403$) correspondingly in comparison with control groups. Regeneration of glycogen content in muscle is complete only after one month past the suffered acute intoxication with deltamethrin.

Thus, the research has revealed that during week 1 after a single introduction of deltamethrin in dose 17,4 mg/kg of body mass a decrease in glycogen content in muscle of experimental animals is observed. Restoration of muscle glycogen level is completed only after one month.

The work is submitted to the International Scientific Conference "Fundamental research", Prague, the Czech Republic, May, 10–16, 2017, came to the editorial office on 12.04.2017.

Short Reports

STRUCTURE OF ASTRAGALUS SULCATUS L. (FABACEAE) POPULATIONS

Ilina V.N.

Samara State Social-Pedagogic University, Samara, e-mail: 5iva@mail.ru

The article provides data on onthogenetic structure of natural populations of *Astragalus sulcatus* L. (*Fabaceae*) that is rare in steppe and forest-steppe areas of Russia. Numbers of specimen can vary by years, populations can be nature or aged normal incomplete with interrupted one-peak right-side onthogenetic spectre.

Preservation of vegetative surface requires a careful study of specific specimen among rare kinds of plants. Such works obtain a special importance in formation of regions' Red book. A significant number of kinds require protection in Samara region [1–4]. Variety of the flora in this region is defined by its location in two natural areas – steppe and forest-steppe.

We have undertaken a study on population structure of *Astragalus sulcatus* L. (*Fabaceae, Leguminosae, Papilionaceae*). During the work we used population-onthogenetic methods of collecting and processing data that have become traditional and are based upon discrete description of onthogenesis among model specimen and definition of vitality among specimen and natural populations. Onthogenesis of this astralag was studied in Penza region (Russia) [5]. The kind is widely spread in Europe, Siberia, Middle and Central Asia. It is a many-ears grassy plant scape-root plant. Protected in certain regions of Russian Federation (for example, Voronezh, Samara, Tambov region). Majority of populations count a small number of specimen. Grows in meadow and steppe communities on various types of soils (from salted to carbonate). Emergence of germs is complicated by presence of solid rind on seeds [1, 5].

It has been established that in terms of low strain or lack of it *A. Sulcatus* is presented in mature normal incomplete populations with interrupted single-peak centered specter with maximum at mature generative plants (31%). No senile specimen were registered in populations. Generative core is presented among 76% of specimen. Anthropogenic transformation of soil-vegetative surface provides for transition of population to aging normal incomplete with interrupted single-peak right-side specter with maximum at aged generative specimen (35%). Besides, as in the previous case, left part of onthogenetic specter (from germs to virginile condition) falls out completely. Generative specimen are presented among 86% of samples. Basic onthogenetic specter for the studied cenotic populations is also incomplete with prevalence of mature generative specimen (about 40%), a high position is occupied by plants with aged generative group (almost 24%), generative core forms about 78%. Germs and juvenile plants were not registered in the studied populations, and it is explained by transience of onthogenetic condition, catastrophic death among young specimen, and period of observation (July-August). No doubt, additional research on astragal population will be required at the moment of teenager emergence from seed bank. Spatial location of specimen in kind populations is random, plants can be distanced significantly from each other, large accumulations of specimen were not registered.

During the period of observing natural populations, we have established that number of kind specimen varies in years; the following factors limit development of specimen and their populations: ploughing of territories, hay cutting, steppe fires, unlimited cattle pasture, and also special features of ontho- and morphogenesis; populations of kind with low vitality level and prevalence of generative specimen, reproduction of specimen is insufficient to sustain permanent numbers in populations, specimen density is low; in separate seasons specimen do not fixate, obviously, being in idle condition.

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THE INFLUENCE OF THE HORMONES OF EPIPHYSIS TO THE REPRODUCTIVE SYSTEM

[1,2]Okulova I.I., [1]Zhdanova O.B., [3]Chasovskikh O.V., [1]Kondocova C., [1]Gareeva A.F., [1]Novoselova N.N., [1]Buldakova J.S.

[1]Medical University Kirov Medical University Russian Ministry of Health, Kirov;
[2]Russian Research Institute of Game Management and Fur Farming RAAS, Kirov, e-mail: Okulova_I@mail.ru;
[3]Of the Vyatka State Agricultural Academy, Kirov

Epiphysis is a small endocrine gland in the vertebrate brain. Also it known as pineal gland, also

the pineal body because the shape of the gland resembles a pine cone. Epiphysis is located in the epithalamus, near the center of the brain, between the two hemispheres, tucked in a groove where the two halves of the thalamus join.

The pineal body consists in humans and mammalians of a lobular parenchyma of pinealocytes surrounded by connective tissue spaces. The gland's surface is covered by a pial capsule. The pineal gland consists mainly of pinealocytes, but four other cell types have been identified. As it is quite cellular (in relation to the cortex and white matter). The pinealocytes consist of a cell body with 4–6 processes emerging. They produce and secrete melatonin. The pinealocytes can be stained by special silver impregnation methods. Their cytoplasm is lightly basophilic. With special stains, pinealocytes exhibit lengthy, branched cytoplasmic processes that extend to the connective septa and its blood vessels. Interstitial cells are located between the pinealocytes. They have elongated nuclei and a cytoplasm that is stained darker than that of the pinealocytes.

Melatonin (***N***-acetyl-5-methoxy tryptamine) is a serotonin derived hormone which modulates sleep patterns in both circadian and seasonal cycles. Melatonin is a hormone that is produced by the pineal gland in animals and regulates sleep and wakefulness. Melatonin is also produced in plants where it functions as a first line of defense against oxidative stress. Nearly all vertebrate species possess a pineal gland. *Branchiostoma lanceolatum*, the nearest existing relative to vertebrates, also lacks a recognizable pineal gland. The lamprey (considered almost as primitive as the hagfish), however, does possess one. A few more developed vertebrates lost pineal glands over the course of their evolution. The human pineal gland grows in size until about 1–2 years of age, remaining stable thereafter, although its weight increases gradually from puberty onwards. The abundant melatonin levels in children are believed to inhibit sexual development, when puberty arrives, melatonin production is reduced.

Materials and methods. Scientific examinations is conducted in the veterinary laboratory of Russian Institute of hunting and farming, Kirov region with red fox which belongs to breeding fur farm "Vyatka". Two groups of the foxes is organized: control group (7 animals) and the experimental group (7 animals). The experimental groups were injected subcutaneously in the interscapular region by melatonin-retard (melakril) in the dose of 10 mg per 1 animal. In the control group, this drug was not injected. The samples of the ovaries were fixed in the 5% solution of formaldehyde. Making of paraffinic histological slices with thickness 5–7 mkm is conducted with standard methods of G.A. Merkulov [4].The slices were coloured by Mayer`s hematoxilin and eosin. The digital material is made by statistic methods with using the program "Biostat". Reliability of the results is valued by Student`s criterium.

Results. At morphological examination of ovaries the primordial, the primary and the secondary follicules, tertiary follicules the atretic bodies and the yellow bodies were found. In control group atrophy of the ovaries with excrescence of connective tissue in the stroma and the absence tertiary follicules and atretic bodies were noticed. At morphometric examination of the ovaries of the red foxes in the experimental group the square was more 2.25 times in comparision with the control, the quantity of the premordial follicules was more 2.4 times, the primal - 2.8 times, the secondary – 2.4 times, the yellow bodies – 11 times. Morphometric and morphologicacal parametres of the foxes before and after the melakril injections differed in experimental and control group: first of all square of the ovaries in experimental group were 21006,6 mkm; in 9302 mkm.

Calcification of the pineal gland is typical in young adults, and has been observed in children as young as two years of ag [2]. The calcified gland is often seen in skull X-Rays [2, 3]. Calcification rates vary widely by country and correlate with an increase in age, with calcification occurring in an estimated 40% of Americans by their 17th year. [1, 2] Calcification of the pineal gland is largely associated with corpora arenacea also known as "brain sand". Calcium, phosphorus, [1] and fluoride deposits in the pineal gland have been correlated with aging, showing that, as the brain ages, more deposits collect. By old age, the pineal gland contains about the same amount of fluoride as teeth.[2] Pineal fluoride and pineal calcium are correlated. It seems that the internal secretions of the pineal gland inhibit not only the development of the reproductive glands but also them degenerations.

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THE OBTAINING OF COMPOUNDS $Cu_2SN_3S_7$, CU_2SNS_3 AND CU_4SNS_4 BY HYDROCHEMİCAL METHOD

Huseynov G.M.

Nakhchivan Branch of National Academy of Sciences of Azerbaijan Institute of Natural Resources, Azerbaijan, e-mail: qorxmazhuseynli@rambler.ru

Cu_2SnS_3, Cu_4SnS_4 and $Cu_2Sn_3S_7$ compounds obtaining condition were investigated by the method of hydrochemical using aqueous solutions of CuCl, $SnCl_4$ and CH_3–CS–NH_2 compounds by the methods of differential-thermal (DTA), X-ray, scanning electron microscopic (SEM). It was determined that, obtained sediments from the mixture of solution which is the molar ratios of the elements in the compound at a temperature of 70 °C are Cu:Sn:S=2:1:3; 4:1:4 and 2:3:7 when thermal processing this sediments at 400 °C Cu_2SnS_3, Cu_4SnS_4 and $Cu_2Sn_3S_7$ containing compounds are obtained. According to DTA results, the nanosized Cu_2SnS_3 and Cu_4SnS_4 compounds are respectively melting at 834 °C and 855 °C. When the temperature more than 673 °C the $Cu_2Sn_3S_7$ compound is decomposed to $Cu_2Sn_3S_7 \rightarrow Cu_2SnS_3+2SnS_2$ reaction and complete melting occurs at 803 °C. Compounds are more durable at the pH=6÷8. It has been found that, the formation of nanostructure increases in this trend $Cu_2Sn_3S_7 \rightarrow Cu_2SnS_3 \rightarrow Cu_4SnS_4$.

Keywords: hydrochemical methods, solution, vacuum, nanoparticle, microphoto, condition

The binary and the complex chalcogenides of copper are among the important functional materials of modern technology. Many of these class compounds are semiconductors, photo-, seqneto- and thermoelectric materials, solid superion conductors etc. as widely used or considered perspectively for the application [1–11].

It has been understood from researches in the Cu–Sn–S system in the past 40 years that more than 20 compounds are obtain in this system and interesting compounds are observed in some of these compounds. The thin layers of compounds containing Cu_3SnS_4, Cu_2SnS_3 and Cu_4SnS_4 have p-type conductivity and it was considered new and perspective materials for the solar energy converter devices. It allows the establishment of new generation thermoelectric devices based on them detection of good thermoelectric properties in compounds containing Cu_2SnS_3 and $Cu_4Sn_7S_{16}$ [7, 9, 11].

The compounds Cu_3SnS_4, Cu_2SnS_3, Cu_4SnS_4, $Cu_2Sn_3S_7$, $Cu_2Sn_{3,5}S_8$, $Cu_2Sn_{3,75}S_8$, $Cu_2Sn_4S_9$, $Cu_2Sn_{3,34}S_{7,68}$ and $Cu_4Sn_7S_{13}$ present in the Cu–Sn–S system are stable at room temperature. $Cu_{10}Sn_{12}S_{13}$ 400 °C is above, $Cu_5Sn_2S_7$ and $Cu_7Sn_3S_{10}$ are stable above 600 °C. The pseudobinar Cu_2S-SnS_2 system has been found to have four compounds: Cu_2SnS_3, Cu_4SnS_4, $Cu_2Sn_3S_7$ and $Cu_4Sn_3S_8$. Cu_2SnS_3, Cu_4SnS_4 and $Cu_2Sn_3S_7$ from these compounds are stable at room temperature. The $Cu_4Sn_3S_8$ compound can be available at a temperature range of 685–785 °C. Some physical-chemical properties of these compounds – crystal structures, melting and polymorphic conversion temperatures were investigated via X-ray and DTA methods [1–11].

The element compounds or binary compounds (Cu_2S və SnS_2) of thiostannates of copper are synthesized by melting (1200 °C) together in vacuumed (~10^{-2} Pa) quartz ampoules. In some studies [10] Cu_2SnS_3 and Cu_3SnS_4 containing compounds were obtained hydro- and solvothermal method and their optical properties were investigated. Deposition conditions and endurance limits of intermediate phases were investigated in Cu–Sn–O–H system in aqueous solution [8].

Nowadays, obtaining the thiostannates by chemical precipitation from aqueous solution and learning their properties is one of the most actual issues. Generally, nano-sized particles of the substances are formed in the thin layers obtained by chemical precipitation from aqueous solution. As is known, many physical-chemical properties of nano-particles are differ from properties of dense materials.

The aim is to investigate the obtaining conditions for the Cu_2SnS_3 Cu_4SnS_4 and $Cu_2Sn_3S_7$ compounds using the aqueous solutions of CuCl, $SnCl_4$ and CH_3–CS–NH_2 compounds.

In the article the results of the synthesis of Cu_2SnS_3 Cu_4SnS_4 and $Cu_2Sn_3S_7$ compounds from aqueous solution by hydrochemical method were given by X-ray, DTA and scanning electron microscopic analysis methods.

Experimental part and discussion of the results

Three samples were taken from the 0.1 M $SnCl_4$ solution for the obtain Cu_2SnS_3 Cu_4SnS_4 and $Cu_2Sn_3S_7$ compounds. CuCl have been resolved in the $SnCl_4$ solutions by weighing appropriate amount of to the stoichiometric structures of the proper compounds in the analytical scale. Then 0.1 M CH_3–CS–NH_2 solution was added in stoichiometric quantities

on each samples in the inert condition (N_2), the pH of the condition was raised to 6 with 0.1 M NH_4OH solution and the solution was stirred for 30 minutes at 70 °C with a magnetic stirrer. The molar ratio of the elements in the solutions has been like Cu:Sn:S=2: 1:3; 4:1:4 and 2:3:7. The following device was used to make the experience (in N_2 atmosphere) (fig. 1).

Acquired sediments was filtered, firstly washed with pure water, then with ethanol, then dried in the vacuum at (~10^{-1} Pa) 80 °C for a hour. The dried sediments were thermally processed for 2 hours in quartz ampoules (~10^{-2} Pa) vacuumed at 400 °C. Reaction equations can be written as follows when occur during the acquire of Cu_2SnS_3 Cu_4SnS_4 and $Cu_2Sn_3S_7$ compounds:

$$2CuCl + SnCl_4 + 3CH_3CSNH_2 + 6H_2O \rightarrow Cu_2SnS_3 + 3CH_3COOH + 3NH_4Cl + 3HCl,$$

$$4CuCl + SnCl_4 + 4CH_3CSNH_2 + 8H_2O \rightarrow Cu_4SnS_4 + 4CH_3COOH + 4NH_4Cl + 4HCl,$$

$$2CuCl + 3SnCl_4 + 7CH_3CSNH_2 + 14H_2O \rightarrow Cu_2Sn_3S_7 + 7CH_3COOH + 7NH_4Cl + 7HCl.$$

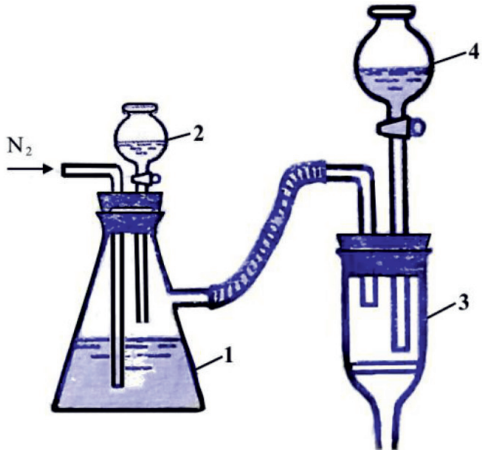

Fig. 1. Scheme of the device used to acquire Cu_2SnS_3 Cu_4SnS_4 and $Cu_2Sn_3S_7$ compounds [6]: 1 – mixture of $SnCl_4$ and CuCl which it is in the flask; 2 – the funnel drop filled with solution of CH_3–CS–NH_2; 3 – funnel to filter the sediment; 4 – funnel to clean down

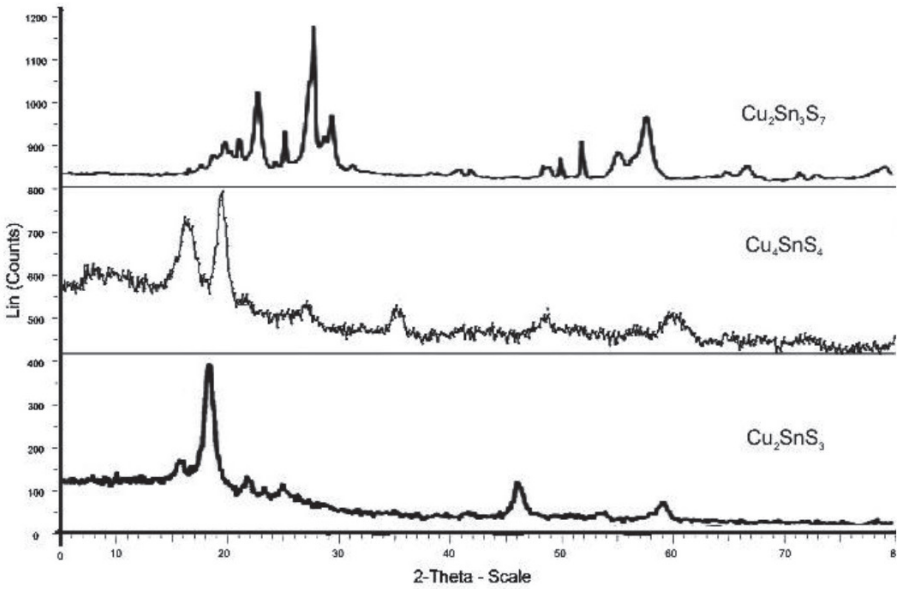

Fig. 2. Diffractograms of Cu_2SnS_3 Cu_4SnS_4 and $Cu_2Sn_3S_7$ compounds

The individuality of the obtined compounds has been confirmed through RFA (2D PHASER "Bruker", CuK_{α}, 2θ, 20–80 deg.) and DTA (pyrometr HTP – 70, device Термоскан-2, inert condition) methods (Fig. 2). According to X-ray results, it has been found that the Cu_2SnS_3 compound crystallizes in cubic syngony (Lattice par.: *a = 0,5438 nm*) and the Cu_4SnS_4 compound crystallizes in the orthorhombic (Lattice par.: *a = 1,3487 nm, b = 0,7656 nm, c = 0,6388 nm*) structure. The $Cu_2Sn_3S_7$ compound crystallizes in the monoclinic (Lattice par.: *a = 1,2676 nm; b = 0,7346 nm, c = 1,2759 nm, β = 109,60⁰*) syngony.

According to DTA results, the Cu_4SnS_4 combination is melting at 834 °C and the Cu_2SnS_3 combination is at 855 °C. The temperature more than 673 °C the $Cu_2Sn_3S_7$ compound is decomposed to $Cu_2Sn_3S_7 \rightarrow Cu_2SnS_3 + 2SnS_2$ reaction. Obtained mixture melts at 803 °C. Three endothermic effects were observed at temperatures of 673, 687 and 778 °C in the DTA curved of this compound, which is appropriate for phase transitions of the compound.

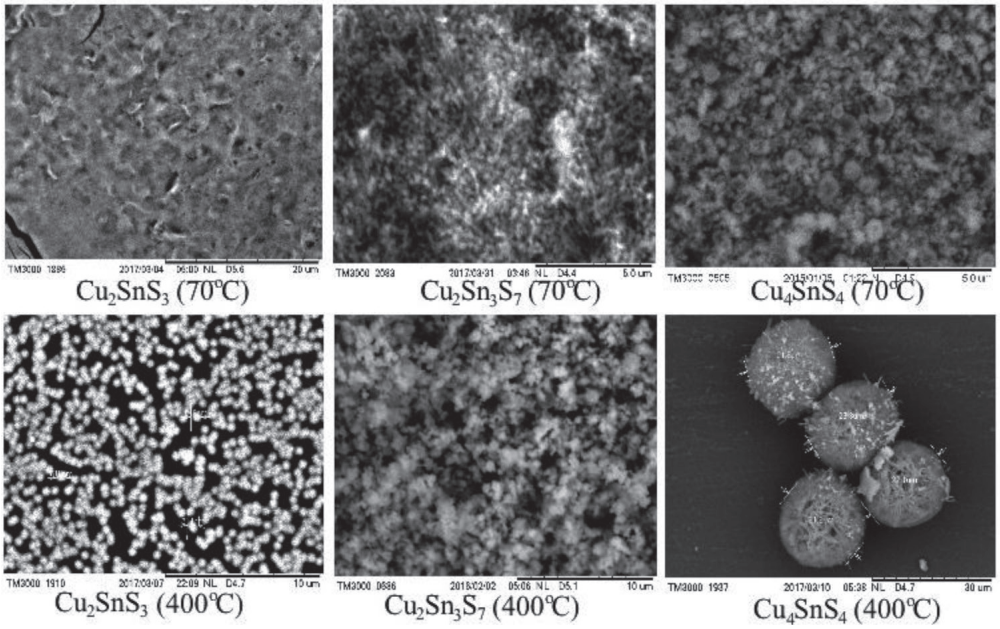

Fig. 3. Microphotos of Cu_2SnS_3 Cu_4SnS_4 and $Cu_2Sn_3S_7$ compounds taken at 70 °C and thermally processed at 400 °C

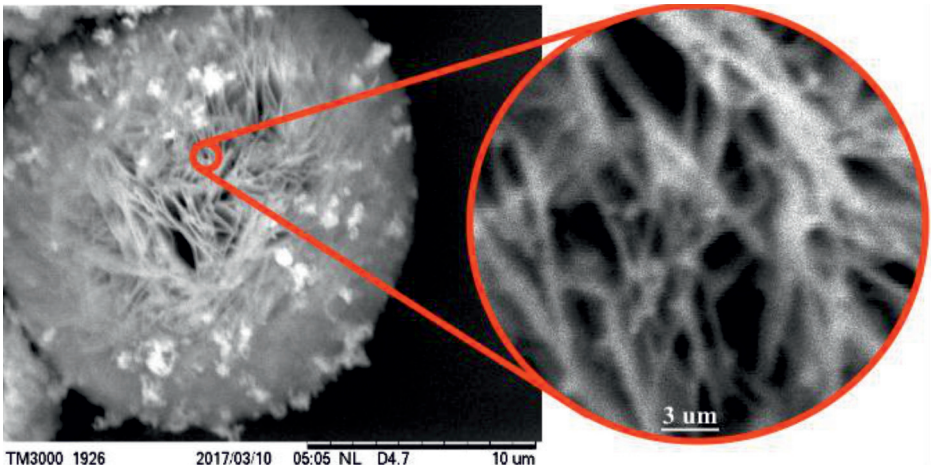

Fig. 4. Microphotos of the surface (10 mkm area) and the internal (3 mkm area) of spherical shaped particles of the Cu_4SnS_4 compound

Results of elemental analysis of compounds

Compound	The amount of elements, %					
	Cu		Sn		S	
	Weight	atom	Weight	atom	Weight	atom
Cu_2SnS_3	36,69	32,83	34,79	16,67	28,52	50,50
Cu_4SnS_4	50,72	44,43	23,68	11,11	25,60	44,46
$Cu_2Sn_3S_7$	17,95	16,66	50,32	24,99	31,73	58,35

The Cu_2SnS_3 Cu_4SnS_4 and $Cu_2Sn_3S_7$ compounds micromorphology have been studied by the Hitachi TM3000 brand microscope. Therefore, thin layers of Cu_2SnS_3 Cu_4SnS_4 and $Cu_2Sn_3S_7$ compounds were prepare on glass substrate and SEM photographs were taken (fig. 3). As can be seen from the SEM images, the compounds at 70 °C are essentially amorphous condition. When the thin layers are thermally processing at a vacuum of 400 °C, spherical shape structure formation is observed in Cu_2SnS_3 and Cu_4SnS_4 compounds. The $Cu_2Sn_3S_7$ combination is formed by large aggregates of nanoparticles of non-spherical shaped high adhesion. The Cu_2SnS_3 compound consists of nanoparticles with a size of 60–100 nm. The Cu_4SnS_4 compound is spherical shaped nanostructure with a diameter of 15–20 mkm. It has been found that the inside of spheres are composed of nanofilaments (Fig. 4).

As shown in the microphotos, the formation of structure is increasing in this trend $Cu_2Sn_3S_7 \rightarrow Cu_2SnS_3 \rightarrow Cu_4SnS_4$. The reason for this can be explained by the increase of the mass share (18,05%, 37,32% and 40,57%) in this trend. It has been found that, when the T > 500 °C the particles adhere occurs and the relevant structures are broken down. Elemental analysis was carried out (XL Launch Trion dilution refrigerator – OXFORD device) of the contents of obtained sediments to clarify the stoichiometric content of Cu_2SnS_3, Cu_4SnS_4 and $Cu_2Sn_3S_7$ compounds. According to the obtained results, the masses and atomic ratios of copper, tin and sulphide contained was determined in the compounds (Table).

According to the obtained results (table), it has been determined that the prices of experimental determined copper, tin and sulphide mass and atom shares are well compatible with the stoichiometric content of Cu_2SnS_3, Cu_4SnS_4 and $Cu_2Sn_3S_7$ compounds. It was found that, the amount of sulphate in the contents of the compounds is slightly swerve (0,01–0,02 at.%) from the stoichiometry. It is to be explained with this that when adding ($CuCl + SnCl_4$) thioacetamide solution to the initial mixture, certain amount free sulfur is separated because of the condition is acidic (pH = 2–2,5) and which it is remains in the synthesized compounds.

As is known, the properties and structure of the obtained thin layers by the hydrochemical method depend on the number and amount of components of the initial mixture. Therefore, when the synthesis of thiocompounds by the hydrochemical method, determination of the endurance limits of the compounds is considered as one of the main factors. In this respect, the precipitation conditions of the Cu_2SnS_3 Cu_4SnS_4 and $Cu_2Sn_3S_7$ compounds were investigated and it was determined that the maximum yield (96–97%) of these compounds at 70 °C is observed in the range of pH = 6–8. 0,1 M HCl and 0,1 M NH_4OH solutions were used to change the pH of the condition. It has been found that, when the pH > 8 the hydroxothiosalts are obtained in the system and when pH < 2 the relevant compounds are separated.

Conclusion

Cu_2SnS_3, Cu_4SnS_4 and $Cu_2Sn_3S_7$ compounds based on aqueous solutions of CuCl, $SnCl_4$ and CH_3CSNH_2 compounds were obtained by hydrochemical method and the individuality of the compounds was approved by X-ray and DTA methods. It has been found that, when the obtained sediments in the CuCl–$SnCl_4$–CH_3CSNH_2–H_2O system (pH = 6÷8) at 70 °C perform thermal processing at 400 °C, the nanoparticles of the relevant compounds are formed. When the T>500 °C, nanostructures are broken down because of the particles adhere occurs. When the pH>8, the hydroxothiosalts are obtained in the system.

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THE ROLE OF INTERNATIONAL FOOD SAFETY STANDARDS IN THE RULES OF THE WORLD TRADE ORGANIZATION

Bortanova Zh., Uazhanova R.U., Bektemisova Zh., Tungishbaeva U., Kazhymurat A., Mukhamedieva M., Ualiulla B.

Almaty Technological University, Almaty, e-mail: raushan_u67@mail.ru

The article examines the state issues to ensure and guarantee the safety of food, the problem of regulating the safety of food products of states at the international level. Its importance and relevance of the documents of various international organizations and conferences. Held description of legal instruments in the field of ensuring global food security, the existing legal solutions at the national, regional and international level, the need for new international legal agreements governing food safety, as well as the establishment of a special coordinating body to ensure compliance with international food standards and guidelines, to adopt uniform legal principles and approaches of regulation, which would provide a mechanism for their implementation.

Kewwords: sanitary or phytosanitary measures, WTO procedures, food safety, World Trade Organization

In the context of the interpenetration of the legal system and the close interweaving of economic and other intergovernmental and private relationship to food and food safety is one of the main tasks of the twenty-first century.

An important condition for achieving global food security becomes the implementation of an effective international monitoring and coordination of international cooperation in this field. The solution to this problem can be achieved if the introduction of the states in the national legislation on the basis of best practices in line with international requirements and standards.

The entry of Kazakhstan into the global system of trade relations within the framework of the World Trade Organization (WTO) was the most important prerequisite for the further development of the country. However, in the literature there are concerns about the fact that membership in the WTO is a certain risk for the sanitary and epidemiological welfare of the population. A further reduction of tariff barriers, reduction of state support, the elimination of import quotas and export subsidies, import of cheap and not always high-quality food can have a very significant impact on the processes in the field of domestic production and turnover of food products [9].

Marrakesh Agreement Establishing the World Trade Organization refers to those international agreements that have an impact on the entire system of law. Implementation adopted at the WTO obligations affects nearly all economic and legal spheres, which inevitably leads to the need to protect social values such as life, health, well-being of animals, plants and the environment. However, the introduction of restrictive technical, sanitary and phytosanitary measures, in certain cases, it may be considered contrary to the rules of the WTO and become the basis for the emergence of an international trade dispute.

Food safety refers to basic problems of food security in Kazakhstan.

Objectives of the study

The aim of the study is the international food safety regulation in the framework of the World Trade Organization and the impact of the WTO on the domestic legislation of Kazakhstan.

To achieve this goal the author poses the following problems:

– To determine the place and role of the World Trade Organization in the global system of food safety.

The object of this study is the relationship between the subjects of international law arising about food safety.

As a subject of research, the rules of WTO law and its application, as well as the activities of States and international organizations in the field of food safety.

As the regulatory framework of this study were used international legal instruments of the World Trade Organization: Marrakesh Agreement Establishing the World Trade Organization; General with the announcement on Tariffs and Trade (GATT); Understanding on Rules and Procedures Governing the Settlement of Disputes; Agreement on the Application of Sanitary and Phytosanitary Measures; Agreement on Technical Barriers to Trade; other acts, including the reports of the panel and the Appellate Body. In addition, they were examined international instruments in the field of food safety, as well as the normative legal acts of the European Union, the Eurasian Economic Union, the Customs Union.

Methodology and research methods are complex scientific and special methods of cognition. The basis of the methodology performs general scientific dialectical method. To make the necessary generalizations, development of classifications studied concepts and phenomena, as well as the reasoning of the findings were applied scientific methods integrated system of study, as well as special and particular methods of scientific knowledge, including systematic, logical, formal and legal, comparative legal, historical statistical.

Scientific novelty consists in the fact that studied the complex current theoretical as well as theoretical and practical issues related to food security in connection with the accession of Kazakhstan to the World Trade Organization. Established place and role of the WTO in the international legal system to ensure food safety, the scope of its powers defined.

In addition, highlighting a number of the most pressing issues related to the trade of genetically – modified products, the application of the precautionary principle, the relationship of the WTO rules of law in the resolution of disputes in the World Trade Organization.

Improving food safety is the foundation of the changes in health and nutrition, and thus one of the major food security problems.

Currently, the international documents and national legal acts there are concepts such as "food security", "food safety" [3, 9], "food safety", "food safety", "food security" [4, 9]. Common law concepts in international instruments are not currently produced. Recognizing the terminological differences, taking into account features of use at the international and national level, the author considers it necessary for the purposes of this paper to use the generic term "food safety" [8].

The Codex Alimentarius Commission [14, 9] defines "food security" as a guarantee that the food will not cause harm to the health of the consumer in the preparation and / or consumption, in accordance with its purpose [1, 9]. In turn discloses FAO Food safety as the absence or presence of a safe and acceptable level of contaminants, impurities, natural toxins or any other substance.

The EU legislation emphasizes the importance of all aspects of continuous food production chain – from primary production and the production of feed and ending with the sale or supply of food to the consumer.

At the level of European legislation in this area was adopted a number of normative legal acts (directives and regulations) [10]. The fundamental piece of legislation is a Regulation of the European Parliament and of the Council of 28.01.2002 No 178/2002 "On the establishment of general principles and requirements of food law, establishing the European Authority for Food Safety and consolidation procedures with respect to food safety" [11], which established the general principles and requirements of food law in the field and created the basis for ensuring a uniform approach to the development of food law [12]. One of the key requirements of EU food law is a ban on the introduction into circulation of dangerous food products (Art. 14 of Regulation No 178/2002). Food products are considered hazardous in the event that they are harmful to health and / or unsuitable for human consumption.

Regulation No 178/2002 provides for the establishment of the European Authority for Food Safety. Its tasks include consultation, as well as scientific and technical support of the European Commission in all sectors that directly or indirectly affect the safety of food and feed in the EU. Safety Authority acts as an independent advisory authority and thereby contributes to the smooth operation of the internal market [15, 10].

It provides scientific opinions on controversial issues to EU bodies or Member States to take the necessary to ensure food safety risk management decisions based on the facts of the case. The SPS Agreement applies to all sanitary and phytosanitary measures which may directly or indirectly have a negative impact on international trade. In paragraph 4 of Article 2 of the SPS Agreement states that sanitary or phytosanitary measures consistent with the provisions of the Agreement, be deemed to be in compliance with the obligations of membership from the provisions of GATT 1994 which relate to the use of sanitary or phytosanitary measures, in particular the provisions of Art. XX (b).

The SPS Agreement defines two main objectives: on the one hand, to promote the protection and improvement of human life and health, animals and plants and sanitary-epidemiological situation of the Member States; On the other hand, to prevent arbitrary or unjustifiable discrimination by the Member States due to differences in sanitary and phytosanitary standards [16, 5].

As sanitary and phytosanitary measures in accordance with Annex A refers to measures applied:

a) to protect the life or health of animals or plants within the territory of a member of the risks arising from the entry, establishment or spread of pests, diseases, harmful organisms – disease vectors or pathogens;

b) o protect the life or health of humans or animals within the territory of the Member from risks arising from additives, contaminants, toxins or disease-causing organisms in foods, beverages or feedstuffs;

c) to protect human life or health within the territory of the Member from risks arising from diseases carried by animals, plants or products there of, or in connection with the entry, establishment or spread of pests;

d) to prevent or limit other damage within the territory of the Member from the entry, establishment or spread of pests.

Among the sanitary or phytosanitary measures include all relevant laws, regulations, rules, requirements and procedures covering including requirements to the final product; process and production methods; test procedures, inspection, certification and approval; quarantine regulations, including relevant requirements associated with the transport of animals or plants or the materials necessary for their activity during transport; provisions on relevant statistical methods, sampling procedures and methods of risk assessment; requirements for packaging and labeling directly to ensure food safety.

The SPS Agreement is based on several basic principles and provisions elaborated including on the basis of the practice of dispute resolution: equivalence, transparency, non-discrimination, harmonization of scientific studies and regionalization.

In order to balance the interests of trade liberalization on the one hand, and non-trade aspects, on the other hand, as a determining factor of the SPS Agreement establishes science-based approach [10, 11]. This approach lies in the fact that any sanitary and phytosanitary measure should have a scientific basis and be evaluated in terms of possible risks.

In accordance with clause in contract 5 of the SPS Agreement states. Member States shall ensure that the basis for their sanitary or phytosanitary measures was put relevant circumstances assessment of risk to the life or health of humans, animals or plants, and take into account the risk assessment techniques developed by the relevant international organizations. It must be taken into account available scientific studies; appropriate methods of production and processing; corresponding inspection techniques sampling and testing; prevalence of specific diseases or pests; the presence of zones free of diseases or pests; appropriate environmental conditions and quarantine or other measures.

In the note should also be made relevant economic factors: the potential damage from the loss of production or sales in the event of entry, establishment or spread of a pest or disease; the costs of control or eradication in the territory of the importing Member; the relative cost-effectiveness of alternative approaches to limiting risks. It should also take into account the need to minimize the negative impact on trade.

With regard to the principle of regionalization of Member States shall ensure that their sanitary and phytosanitary measures whether taken in view of sanitary or phytosanitary characteristics of the area – as a whole country, and part of it, or several countries, or parts thereof, from which (-s) and the product originates for which (-s) it is designed. In assessing the sanitary or phytosanitary characteristics of a region, Members shall take into account, inter alia, the degree of prevalence of specific pests or diseases, the availability of programs to deal with them and overcome them, and appropriate criteria or guidelines which may be developed by relevant international organizations.

Exporting members declared that areas within their territories are zones, free from pests or diseases, or areas with low pest or disease prevalence must provide the necessary proof that, in order to objectively demonstrate to the importing Member that such areas are indeed areas, free from pests or diseases or areas of low prevalence of pests and diseases, and in all likelihood will remain as such. To this end, the importing Member is available on request, reasonable access for inspection, testing and other relevant procedures.

The impact on international trade relations through the embodied in the WTO procedures and dispute resolution mechanisms, ensures that each Member State of its obligations in order to maintain the international trading system of interstate relations.

International trade disputes between Member States arising from the use or threat of use of measures restricting access to the respective markets of food products. As a rule, the subject of the dispute is the measure introduced by the State as violating its obligations under the applicable agreement between them. However, there are other cases where the subject of the dispute becomes the measure does not violate the obligations of the state, but nevertheless threatens the interests of other countries [10.

WTO rules prohibit recourse to unilateral and unauthorized response to ensure cessation of the breach [9]. The very fact of accession to the WTO government automatically means the consent to the compulsory jurisdiction of the Authority to resolve the WTO dispute.

In summary, it should be noted that the dispute settlement mechanism plays a special

role in the system of WTO law. According to G.M. Velyaminov, the mechanism is a landmark innovation in international law, and of particular interest from the point of view of not only the use of already existing institutions and the means of dispute settlement in international relations as a close combination of these means, makes it a particularly effective [9]. It is the most productive of the currently existing international dispute settlement procedures, with the exception of the procedures adopted in the framework of certain regional integration [9]. A whole new meaning corresponding to the realities of international life value, which do not involve the states at the time of negotiation of the relevant rules; d) the development and application of procedural principles; d) the creation of prerequisites for the development of a new direction in the legal regulation of international trade [9]. All this is the basis for the development of a new direction in the legal regulation of international trade in food.

It should also take into account the effectiveness of the mechanism for resolving disputes. The effectiveness of the OCR resolution mechanism also indicates a large percentage of reaching an agreement.

The main purpose of the mechanism is to reach agreement between the parties:. In accordance with clause in contract 7.3 Arrangements solution mutually acceptable to the parties to the dispute and consistent with the covered agreements, is preferred. If the state will measure into conformity in the course of the dispute defined obligations, no further action is required of it.

If no mutually acceptable solution to the second purpose of the mechanism is to ensure the abolition of the measures taken if it is established that they are incompatible with the provisions of any of the covered agreements. To this end, it provides an effective executive procedure of the adopted recommendations and decisions, if necessary with the use of repressive measures, as well as permanent monitoring by the OCR until the full resolution of the dispute [9]. In some cases, the very threat of sanctions can induce the respondent State to execute the decision of the panel (Appellate Body).

In fact, a mechanism for dispute resolution is not aimed at that, to punish the wrongdoing State, and the fact that a contract or compensate the financial losses through the balance of trade, thereby bringing an illegal measure in accordance with the agreements of the WTO system [9].

Conclusion

In a globalizing world, taking into account the failure of States to fully ensure and guarantee the safety of the food problem of regulating food safety is attracting increasing attention from the states at the international level. Its importance and relevance is noted in the documents of various international organizations and conferences.

At the moment, there are only a limited number of instruments in the field of ensuring global food security. Existing legal solutions at the national, regional and international levels have significant structural weaknesses. There is a need to create new international legal agreements governing food safety, as well as the establishment of a special coordinating body to ensure compliance with international food standards and guidelines, to adopt uniform legal principles and approaches of regulation, which would provide a mechanism for their implementation.

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DAILY ACTIVITY OF MUD VOLCANOES AND GEOECOLOGICAL RISK: A CASE FROM GAYNARJA MUD VOLCANO, AZERBAIJAN

[1]Baloglanov E.E., [1]Abbasov O.R., [1]Akhundov R.V., [1]Huseynov A.R.,
[2]Abbasov K.A., [3]Nuruyev I.M.

[1]Institute of Geology and Geophysics of the National Academy of Sciences, Baku;
[2]Azerbaijan State Pedagogical University;
[3]Institute of Radiation Problems of the Azerbaijani National Academy of Sciences, Baku, e-mail: elnur1001@mail.ru

"Mud volcanic activity and geoecological risk" problem was studied using visual, satellite, geological, geochemical and radioactive research on the example of a mud volcano Gaynarja located near the Tahtakorpu Water Reservoir. From the viewpoint of the considered relationship, the studies results make possible to think about the probability of a risk factor on several aspects: The reservoir was built in 2007, and to this day the water area has been expanding without taking into account the necessary distance from the mud volcano. Excluding the north-eastern part the mud volcano, other sides of its crater buried beneath the Reservoir water. Due to the daily activity of the mud volcano, heavy toxic metals, gases, radioactive elements and etc. have been ejecting to the Earth's surface in the compositions of various phase of volcanic products and directly contact with the Reservior water. Expansion the Reservoir area and water volume leads to increase in additional geostatistical pressure in volcanic area. In addition, the mud volcano is located near the Shamakhi-Ismayilli active seismic zone in Azerbaijan. Both factors increase the eruption risk the volcano that has been "asleep" for many years.

Keywords: mud volcano, geoecological risk, gas, heavy toxic metal, radionuclide, radioactivity

The Gaynarja mud volcano is located in the Pre-Caspian-Guba geological region (Fig. 1). From the tectonic point of view, the volcano is part of the Telebi-Gyzylburun anticline zone, but geomorphologically, it is located the in the Gusar-Khachmaz Pre-mountain area.

Fig. 1. Location map of mud volcanoes in the Pre-Caspian-Guba region [1]. 1 – Gaynarja; 2 – Saadan; 3 – Khydyrzinde; 4 – Zarat; 5 – Shuraabat; 6 – Yashma; 7 – Zarat-deniz

The volcanic landscape is complicated by the presence of ravines, river valley, volcanic cones (spokas) and gryphons. Along the arch of Gaynarja fold is tracked a lengthwise fault of which amplitude is 150–200 m. Related to the fault, there are several gryphones, sopkas and salses that emitt gas, water and slimy mud from the Earth's deepth to the surface (Fig. 2). The mud volcano differs from other mud volcanoes in the Pre-Caspian-Guba region in Azerbaijan with its relative size, the daily activity of gryphons and salses.

Administratively, the Gaynarja mud volcano has found its development 8-10 km to the south-west of the center of Shabran district, as well as near the Tahtakorpu Water Reservoir (TWR).

The TWR construction began in 2007 and is used since September 28, 2013. The Reservoir area is 8.71 km^2. Total water capacity is 270 million m^3. The width of the hydraulic construction from the bottom is 754 m, the height is 142.5 m.The Reservoir belongs to the Samur-Absheron irrigation system.

Since Azerbaijan is the land of mud volcanoes in the world, 3–4 eruptions of mud volcanoes occur on the country territories in every year. In addition, there are many mud volcanoes in the country that have daily activity. As a result of eruption and daily activity, products with different phase eject to the Earth's surface from the various depths [2–9]. These products are consist of different genetic types of waters

with a high degree of mineralization, gases which mainly consisting of CH_4, CO_2, H_2S, as well as breccias containing radionuclides and heavy toxic metals. Sometimes the concentration of several elements trace in volcanic products exceed their normal distribution in sedimentary rocks, waters, etc. Such periodic activity of volcanoes leads to the covering of volcanic products in the large areas and causes the formation of unique landscapes that harm for ecosystems.

In addition to the mentioned problem, there is one more serious factor related to the anthropogenic impacts to mud volcanoes in Azerbaijan. There are mud volcanoes in which craters and nearby areas have been constructing industrial facilities.

The presented research is intended to the study of ecogeological risks connected with activity of mud volcanoes and anthropogenic influences on the example of the Gaynarja mud volcano and TWR.

Materials and methods of research

Related to the goal of the investigation, some visual, satellite, geological, geochemical and radioactive researches were conducted at the Institutes of Geology and Geophysics and Radiation Problems, Azerbaijan National Academy of Sciences.

The analysis were carried out in gas chromatography to determine the chemical composition of gases in 3 gas and 2 water samples. The amount of organic matter was studied in 3 rocks and 2 water samples. The organic composition of rocks was determined by the performed pyrolysis in two stages.

Elemental analysis were studied in 3 water and 2 rocks samples with Atomic Absorption Spectrometer "200 Agilent" and S8 TIGER – High-end wavelength dispersive X-ray fluorescence (EDXRF) spectrometer.

Radiometric studies were conducted to study the distribution of background radiation on the territory of the mud volcano. The measurements were carried out by radiometers such as "CPP-88M" and "InSpector-1000", which provide measurement of the exposure dose rate of gamma radiation in the range of 0-5000 microR/h.

To study the nature of the radioactivity anomalous, 4 rocks and 3 water samples were collected for gamma spectrometric analysis.

Results of research and their discussion

Since 2007 to the present day the TWR water area has been expanding without regard to keep the necessary distance from the mud volcano (Fig. 3, a, b and c). The building area covers the most parts of the volcanic crater (Fig. 3, c). Associated with this, mud volcanic products are buried beneath the Reservoir water.

The carried out researches confirm that any construction and engineering work in the territories and nearby areas influence their activation [1, 13]. In addition, the mud volcano is located near the Shamakhi-Ismayilli active seismic zone in Azerbaijan. Both factors increase the risk of eruption of the mud volcano [10–13]. On the other hand, the eruption of these mud volcanoes poses a danger to both infrastructures (existing in nearby areas) and the biosphere. Therefore, specialists are considered that depending on the degree of volcanic activity, these works should be carried out at appropriate distances with mud volcanoes.

Fig. 2. Crater area of the Gaynarja mud volcano

a)

b)

c)

Fig. 3. Satellite images of the Gaynarja mud volcano: a) 2007 year, b) 2011 year, c) 2017 year

Gases in the mud volcanoes of Azerbaijan mainly contain CH_4 85–98 % [1]. The gas composition of the Gaynarja mud volcano consists of CH_4 (87–94.0 %), CO_2 (1,1–5,9 %) and N_2 (1,2–9,3 %). The amount of gas components in water samples (sapmled from the salses): CH_4 – 0.00002-0.00126 %; CO_2 – 0.01963-0.91287 %; H_2S – 0.00066–0.00175 %.

Compared to other waters in the region, waters of the Gaynarja mud volcano (emmited to the Earth's surface) are too mineralized (average of 244 mg/eq), and they are hard and chloride-sodium-calcium type waters. The water of one salsa located in the southeast region is very salty (655 mg/eq.).

In water samples: H_2CO_3 varies from 421.6 mg/l to 526.3 mg/l; C_6H_5OH from < 0.001 to 0.0038 mg/l; N from 12.6–37.5 mg/l. Total amount of organic matter ranges from 0.22 to 21.8 mg/l.

Mud volcanoes are mainly located in oil and gas regions in the Rebublic. Eruption of mud volcanoes results with the releasing of volcanic products from the depth of 6-9 km or more, among which oil shale and oil-bearing rocks are traced [1–9]. Age of the oil shales is Paleogene-Miocene and they are very rich with organic matter [14–19]. Laboratory analysis of these rocks gives a positive results for their organic chemistry composition [18–29].

Thus, such oil shales were geochemically analyzed in the study.The amount of organic matter in the oil shale rocks ranges from 9.5 to 12.65 %. It was determined that there was no oil in the rock composition. The amount of gas composition varries from 2.43 to 5.24 % at a temperature of up to 500-550 °C. Increasing the temperature to 800-850 °C lead to the reduction of gases (1.20–2.67 %). Thus, the analysis of organic chemistry of volcanic rocks by the method of pyrolysis shows that the organic mattre in the composition of rocks basically consists of gases and koks (Table 1).

Most of the elements (Hg, As, Mo, Co, Zn, Pb, P, etc.) were identified in volcanic breccia and water. Some of them are traced with high amount (more than for their normal concentration in the sediments and waters) in volcanic breccia. Forexample Hg: 0.0000031-0.0000042 %, As: 0.0003-0.0004.1 %, Sr: 0.0462–0.0487 %; Pb 0.0021–0.0043 %. The results of elemental analysis of water samples from the Gaynarja mud volcano are shown in the Table 2.

Radiometric measurements were carried out on 6 profiles crossing the mud volcanic field and oriented along the SE-SW and SW-SW directions. The radioactivity of breccias in the mud volcano varies widely – from 9.5 mR/h to 23 mcR/h. Relatively high values of radioactivity are traced in the central, northern and northeastern parts of the volcano (Fig. 3).

To study the nature of the radioactivity anomalous, the breccia samples were collcected both from points with relatively high and low radioactivity. The analysis results are shown in Table 3. The breccia activity in the mud volcano varies in wide range – from 106.4 to 515.12 Bq/kg. It reflects the overall level of integral gamma radiation, depening on the composition and content of radionuclides present in the rocks. In the samples 1 and 4, gamma radiation level is basicly depends on uranium (U) series elements. The amount of thorium (Th) does not exceed Clark, and potassium (K) is always present in rocks of mud volcanoes.

Table 1

Two-stage pyrolysis of rock samples from Gaynarja mud volcano

Sample	Organic matter, %	500–550 °C		800–850 °C	
		Oil	Gas	Oil	Gas
1	12,2	–	2,34	–	2,67
2	12,65	–	4,99	–	1,88
3	9,5	–	5,24	–	1,20

Table 2

Elemental composition of water samples from Gaynarja mud volcano, mg/l

Sample	Hg	Pb	Zn	P
1	0,0018	0,042	0,2	0,0002
2	0,0014	0,034	0,8	0,0016
3	0,0011	0,048	0,6	0,0002

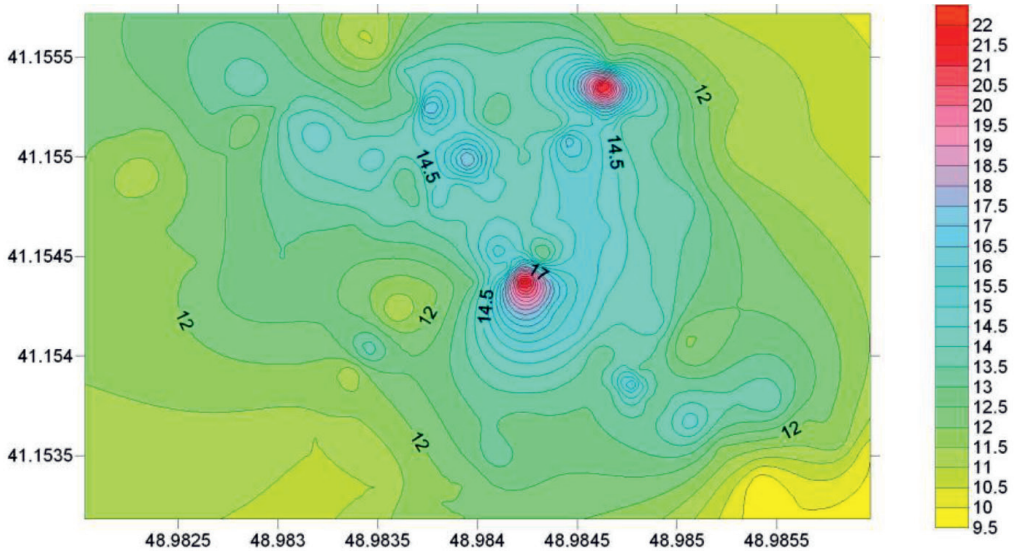

Fig. 3. Distribution map of radioactivity in the crater zones of Gaynarja mud volcano

Table 3

Specific activity and content of radionuclides in the breccia samples of the Gaynarja mud volcano

Samples	Integral radioactivity, microR/h	Activity, Bq/kg	U, Bq/kg	Th, Bq/kg	K, Bq/kg
1	23	481,56	431,81	–	634,61
2	14–15	106,4	50,19	0,45	704,87
3	16–17	118,51	12,15	77,99	208,42
4	23	515,12	480,15	–	671,71

Table 4

The content of radionuclides in the water samples from the salsas of Gaynarja mud volcano

Radionuclide	Sample – 1	Sample – 2	Sample – 3	Norm for drinking water, Bk/L
K 40, Bk/L	25,6 ± 4,2	15,2 ± 1,4	16,6 ± 1,9	22,0
Ra 226, Bk/L	0,228 ± 0,054	0,154 ± 0,024	0,126 ± 0,028	0,5
Ra 228, Bk/L	0,138 ± 0,010	0,324 ± 0,050	0,644 ± 0,036	0,2
Rn 222, Bk/L	0,20 ± 0,12	0,18 ± 0,10	0,10 ± 0,06	120,0
U 235, Bk/L	0,0144 ± 0,0032	0,0064 ± 0,001	0,0120 ± 0,0016	3,0
U 238, Bk/L	0,312 ± 0,069	0,139 ± 0,021	0,261 ± 0,034	3,1

The water samples from salsas were also collected to determine the radionuclide composition. The concentration of radionuclides K40 in sample – 1, and Ra 228 in samples – 2 and 3 exceed the maximum allowable concentration of radionuclides in drinking water (Table 4).

Relatively high radioactivity probably associated with a tectonic fault zones, on which located active salses that release fluids with an elevated radionuclide content (samples 1 and 4, Table 3), that was also confirmed in the laboratory studies results (sample 1–3, Table 4).

Conclusions

The studies results make possible to think about the risk factor probability on several aspects:

Since 2007 to the present day, the Reservoir water area has been expanding without regard to keep the necessary distance from the mud volcano. The reservoir covers a lager part of the volcanic crater, and this factor causes contact of volcanic products and water. The carried out researches confirm that any construction and engineering work in the territories and nearby areas

of mud volcanic structure influence their activation. In addition, the mud volcano is located near the Shamakhi-Ismayilli active seismic zone in Azerbaijan. Both factors increase the mud volcano eruption risk. On the other hand, the mud volcano probabaly eruption poses a danger to both infrastructures existing in volcanic areas and the biosphere.

Due to the mud volcano daily activity, heavy toxic metals, gases, radioactive elements and etc. have been ejecting to the Earth's surface in the compositions of volcanic products and it causes direct contact of these and water. Thus, this factor represent a different kind of danger to the environment and hygiene.

Expansion the Reservoir area and water volume leads to increase in additional geostatistical pressure in volcanic area. In addition, the mud volcano is located near the Shamakhi-Ismayilli active seismic zone in Azerbaijan. Both factors increase the mud volcano eruption risk.

This work was supported by the Science Development Foundation under the President of the Republic of Azerbaijan – EİF/GAM-2-2013-2(8)-25/15/4.

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THE IMAGE OF MAKHAMBET UTEMISULY IN KAZAKH LITERATURE

Yerzhanova S.B., Kozhekeyeva B.Sh.

Kazakh State Women's Pedagogical University, Almaty, e-mail: assem.oraz@gmail.com

In this article written about kazakh poet – Makhambet Utemisuly, who is the person who takes a provocative place in the history of Kazakh literature on the road to freedom of Kazakh people. His name is written in Golden letters in the history and will remain the memory of his courage. Poet Makhambet' way of life and left heritage to Kazakh people was fully researched. The study of the heritage of Makhambet revealed the value of his poetry, firmly occupy his place in history.

Keywords: the history, Makhambet, hero of Kazakh nation, great poet, freedom, way of life

In history, only the truth should be written ... Today is the history of tomorrow. Every nation has its own story that they experienced. Similarly, the Kazakh nation has its own centuries-old history. In kazakh history, there are many personalities whose hearts have fought for their country, nation and land. Each era has its own hero. There are many of those, who defended their homeland at the same time wrote and glorified the exploits of other heroes. The history and literature are the witness here. As the folk saying goes: "A prosperous country leaves its history on a rock, a dying country writes its history with tears". If this is so, then we can confidently say that our nation is truly a growing, because our people have passed through the thorns of fate, having experienced many difficulties, opposing many opponents, defeating all the difficulties, as well as conveying the whole truth of life to the descendants and having written everything both on stones and on a paper. The history of each epoch must be written in due time. After all, history can not be changed. History has never been changed, and did not change even when the King of Rome burned the bones of all the kings (who ruled before him) in the sarcophagus with the words: "The story begins with me". So our people's history lies in the depths, on the very roots. The witness of which the bitter truth of every age.

Representatives of the Kazakh people have long been considered as orators, people with a sharp but honest character, with freedom-loving disposition. One of such representatives of the Kazakh people is Makhambet Utemisuly, who was not only an eloquent speaker that with one word could resolve the disputes, but also possessed a powerful force and fighting character. Who is Makhambet? Who is he? He is a poet, he is a hero, he is that Kazakh who was a preacher of honesty and justice. The history have the witnesses about these statements too. The main witnesses is the poetic works of Kazakh literature, dedicated to the courage and heroism of Makhambet. There are just a few of such writers and poets among the people who did not write about Makhambet and did not dedicated a song to his heroism.

In the Kazakh literature there are many opinions about the origin and clan of Makhambet. One of which is the opinion of Halel Dosmukhameduly: "Makhambet is from the clan – Berish". The grandfather of Makhambet is Utemis, and Utemis's grandfather is Kulmaly. "Mali was a captive taken by the enemies".

Berish, adopted the children of Tumash. He called himself a descendant of King Nadirche. The Kurmaly nowadays is a separate clan residing in the county of Gerieva, the village of Taysogan. "There is another similar opinion of the Astanian poet Serik Turgynbekov. In the poem of the poet "Makhambet and Khan Jangir" it is said that Makhambet is the descendant of the Persian king. Maybe possibly the grandfather of Makhambet had Persian Roots, and his mother was from the genius Berish .There is an information to prove it:

Whatever the poets would say, we know that Makhambet is a brave hero for the Kazakh people who aspired to the independence of his people and land. Professor Syzdykova K.A. in turn believes that the very first data on Makhambet came out even during the lifetime of Makhambet and she confirms this in the following words: "The first data on the creative life of the great poet Makhambet were mentioned during his lifetime, in 1843 in the work of E.P. Kovalevsky "Wanderer by land and sea". This scientist was close friend with Shokan Valikhanov and N. Chernyshevsky. We also know that some of Makhambet's songs were published in the collection "Songs of the poet Murat" in 1908, in Orenburg. An analysis of his poems and biographies firstly were published in Tashkent, in 1925 by Halel Dosmukhameduly.

One of the first who wrote about the life and work of Makhambet Utemisuly was Mukhtar Auezov. He made a literary and scientific analysis based on a collection written about the life and creation of Makhambet, entitled "Isatai-Makhambet", published in Tashkent in 1925. The data provided by Professor K. Syzdykova are close to the truth. And the truth is that the very first researcher of Makhambet's creativity was Mukhtar Auezov.

The name of Makhambet Utemisuly became widely known among the people during the peasant revolution in 1836-1838, in the head of which was Isatai. There are many of those who hold such an opinion. As Berkayyr Amanshin said: "Regardless of which nation, or at what time, there are enough proofs in the history that in the difficult times of upheavals, great, wise, heroes were born". In 1836-1837 – was not an easy time for the Kazakh people, when during the uprising of the former leaders of the internal Orda against the tsarist colonizations and the pressure of the government, the hero-commander and great poet Makhambet Utemisuly was born. Soon Makhambet himself became the leader, the organizer of such movements for honesty and justice [1. 5 pages]". Yes, Makhambet is not only a writer and poet, but also a brave soldier and leader who raised the flag of independence. It is known in the history, that the people needed such brave heroes and wise personalities as Makhambet and Isatai who, during the tsarist colonization and khan's oppression and cruelty, will support the side of the common people, and will not be on the side of the cruel khans and the tsar for their own good.

The hero Makhambet was an honorable and respected person in his environment. This is evidenced by the opinion of Berkaiyr Amanshin: "A person, who is bright, wise, orator, a person worthy as Makhambet, can not be not active participant in the social life of the people and remain on the side. This can be seen from the fact that when the Father of Makhambet – Utemis-bi was poisoned and soon killed by enemies from poison, which was smeared on the stirrup, Makhambet became the Sergeant-major from all his possible brothers, and not even Bekmagambet bi".

Information about the poet's early life is very small. It is only known that he was captured in 1829 and stayed for more than a year at the Kalmykov Castle for the illegal crossing of the Ural. He was able to escape from there in the autumn of 1830, when the plague came to the nation. In his song found later:

Yesterday we were lying in the dungeon,
We have many imprisoned enemies
The boy from the window,
Were missing his relatives
Wanted to see them once...

Says about this period of life. From the life of Makhambet before the insurrection, only one thing is known: that he married a rich girl from the village Manan. This poet's wife was Ultugan, from whom he had a son, Mahmud (at the moment in Mangystau live Mahmud's great-grandsons from his daughter Nurbike [9 pages]). During his short life Makhambet was able to become a leader of nation and a defender of the people and an eloquent poet. Another of the qualities of the hero was his persistence and perseverance, his words always corresponded to his actions. These properties were seen not only during the uprising, but also when he was only got married and had children, these qualities were also seen. Evidence of his persistence is that he married Ultugan. From his wife Ultugan, he had a son, Mahmud, who had a daughter Nurtugan, now, the great-grandchildren of the great hero from this daughter Nurtugan live in the Kazakh land. It is a great honor and joy for the Kazakh people that there are still descendants of the great hero of nation. In addition to the joy, it is a great value for the younger generation to learn more about the life of the poet.

Makhambet himself was a poet, a dombra player and a performer. He was a very militant person. Besides, he was a real man who would not give up anything. If Isatai controlled people by different methods, like using wisdom, citing the arguments as an example, but Makhambet attracted attention with a warm word and cheerful disposition. When Isatai consulted with the sergeant-major and high-ranking people, Makhambet traveled to nearby houses collecting people around him for singing songs, playing dombra and cheering people. The character of Makhambet was such that he could utter in the face of anyone but he was also a good joker. With the enemy he behaved himself ingeniously and bravely. In 1838, on November 23 Isatai with his thirty associates were detained in the Bekaidar area by Russian detachments. Then Makhambet with his friends drove out the detachments by shooting them with bow and weapons. When they released Isatai, Makhambet and his companions fled from the Russians. The pursuers nearly caught up with Makhambet, when he blew a pillow into the cushion and poured on his catching feathers, thereby slowing them to escape "(Khalel Dosmukhameduly).

Yes, indeed in the character of Makhambet there was a quick temper, stubbornness. But above these qualities he had his poetry, singing and professional game on dombra. Isatay was more than just a friend for Makhambet, he took Isatai more as a brother, and this shows his high-hearted feelings, his loyalty. Makhambet's loyalty can be seen from the fact that he saved Isatai from the enemy's hands with all his cunning and skill at the cost of his life. How Makhambet was not strong and courageous, he understood that he could not lead the people without Isatai. Because, as already mentioned, Isatai was cold-blooded, wise, and Makhambet was quick-tempered. "After Isatai's death, Makhambet could not lead the people. He even lost the number of people that Isatai once recruited into his ranks". That reason was Isatai's death. The crowds parted. People were seized with the thought that if the leader is not good, there is no need to follow him. Yes, indeed, after the death of Isatai, the people were devastated. Makhambet after the loss of a friend lost his spirit, besides he was oppressed that he could not rule the people and lead them along. He himself, moreover, was expelled by the tsar and became an enemy for his relatives at that time. Shortly after Isatai's death, Makhambet died. In some sources it is said that Makhambet was killed by his brother Bi Baimagambet, at the same time, some researchers say that his relative, Ykylas, killed him. To somehow confirm this information, I want to give a few arguments about this. "It was believed that Makhambet died in 1846, on October 20, at his age of 43, from the hands of his relative Yhkhlas Toleev from the Kishi Zhuz, from the Tama clan. To be more precise, there is a legend that Makhambet sat in front of Uhlas to cut his hair, then Uhlas scored his relative with a blade. In fact, the date of Makhambet's death is clear, but the exact cause of his death is not known, "says Kaiyrzhan Abisaitov.

In the information, given by Zeynolla Kabdolov written: "On October 19, 1846, on the land of Karaoi, the head of the great Makhambet was severed." It is known that Makhambet was killed by his enemies in Karaoy, in 1846, that his head was cut down and handed over to Baimagambet, and the body of the great leader and poet who sang of love for the people and his land was not destined to leave his land according to the dignity Sharia. A few years after his death, the descendants found the burial place of Makhambet's body, stole his head from Ikhlas and buried the hero anew.

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MEDICAL ERRORS: CIVIL AND CRIMINAL LIABILITY FOR CAUSING HARM WHEN PROVIDING MEDICAL CARE

Abdulaeva P.Z., Osmanov A.A.
Dagestan State Medical University, Makhachkala, e-mail: patimat1959@mail.ru

Choosing medical activities, we, future physicians must responsibly apply to medical activities. The doctor will have to study all my life, to constantly work on ourselves, and this largely depends on his professionalism. Unfortunately, sometimes, without error in the medical activities, probably not possible, and to avoid medical errors, should address this important topic. Medical errors are divided into deontological, diagnostic and therapeutic. The basis of ethical errors is a violation of the principles of proper behaviour of doctor towards the patient, i.e. the failure by the doctor the ethics of medical practice. The main reasons for diagnostic errors are: ignoring or inept use of history; incomplete examination of the patient; incorrect interpretation of clinical data; incorrect evaluation of x-ray and laboratory tests; carelessness and haste in the examination; incorrect diagnosis statement. However, according to English jurisprudence, error in diagnosis would not be considered criminal negligence if it had complied with the relevant standard for the care of the patient, but will be considered as one of the inevitable hazards that accompany medical practice. Medical errors related to incorrect clinical diagnoses. As a result of these diagnoses the patient is assigned a treatment that does not match the true nature of the disease, and at the same time is not shown and need treatment.

Keywords: medical errors, medical care, liability

The most important principle of health in our country is the quality and availability of medical care. Quality medical care can be called only in the event when it meets the following requirements:

1) the timeliness of the delivery.
2) the Correct choice of preventive methods.
3) select a proper diagnosis, treatment and rehabilitation.
4) Achieving a result that was planned.

The above requirements are reflected in paragraph 21 of article 2 of the Law "On fundamentals of protection of citizens". Nevertheless, quite often we have to deal with the medical errors that occur on exposure to different circumstances. Consequence of medical errors is causing harm to the health and lives of citizens. With medical or a medical error can be encountered both at the stage of diagnosis and during treatment or even surgical intervention. The most common causes of medical errors are:

1) Uncoordinated actions of doctors. Especially if the patient is treated by several doctors.
2) Improper handling of medical equipment.
3) Dismissive attitude to the established sanitary standards.
4) Careless administration of medicines.

For example, if they have been prescribed in the wrong dosage, or do not meet the diagnosis.

Civil liability

Property liability for damage resulting from the provision of medical care is governed by civil law in civil Affairs. In a criminal case brought by law enforcement for committing a crime, the victim can also file a civil suit about property responsibility for damage, which is discussed in a separate civil claim in the criminal process. If this claim is satisfied, then, in addition to criminal penalties, the tortfeasor is obliged to compensate the damage according to the rules of civil procedure, that is, in the form of property (often cash) compensation. Harm may be caused to the plaintiff by any employee of the institution (organization) of health, which he provided medical help. The definition of negligence can be simple in some cases but in other to give the correct qualifications is very difficult. Often the question arises: who is responsible from a rather large clinic staff, which may include a General practitioner, consultant, other hospital specialists and nurses? The definition of a causal link between the alleged negligence of personnel, which allegedly caused the harm, and the harm can also be somewhat difficult. A claim can be brought against the physician when there is reason to assume negligence on his part. In some countries one doctor is solely responsible for the treatment of their patients and the responsibility cannot be imposed on health care institution (clinic), unless the institution did not intervene in the process of treating physician of his patient.

Criminal liability for medical error

Criminal liability for medical error, article the fault of the doctor of the criminal code in relation to medical errors does not provide for a special offence. The actions and omissions of the physician, in which he may be prosecuted as described in the Special part of Criminal code of the Russian Federation.

Article 125. Abandonment in danger

Knowingly leaving without the aid of a person in a life-threatening or health condition and deprived of opportunities to take action for self-preservation on the early childhood, old age, sickness or because of his helplessness, in cases if the guilty had possibility to assist this person and was obliged to have about it care or itself has put it in a life-threatening or health a condition, -shall be punished by a fine of up to eighty thousand rubles or the salary or other income for a period of up to six months, or by compulsory works for a term of up to three hundred and sixty hours, or correctional labor for a term up to one year, compulsory works for a term of up to one year, or with arrest for the term up to three months, or by deprivation of liberty for a term up to one year.

Article 109. Causing death by negligence

1. Causing death by negligence is punished with correctional labor for up to two years, or restraint of liberty for a term up to two years, or hard labor for a term up to two years, or imprisonment for the same term.

2. Causing death by negligence due to improper performance of their professional duties shall be punishable by restraint of liberty for a term up to three years, compulsory labor for a term up to three years with deprivation of the right to occupy certain positions or engage in certain activities for a term up to three years or without such, or imprisonment for the same term with deprivation of the right to occupy certain positions or engage in certain activities for a term up to three years or without it.

3. Causing death by negligence to two or more persons -is punished by restriction of liberty for a term up to four years, or hard labor for a term up to four years, or imprisonment for the same term with deprivation of the right to occupy certain positions or engage in certain activities for a term up to three years or without it.

Article 118. Causing of heavy harm to health on imprudence

1. Causing of heavy harm to health on imprudence -shall be punished by a fine of up to eighty thousand rubles or the salary or other income for a period of up to six months, or by compulsory works for a term of up to four hundred eighty hours, or correctional labor for a term up to two years, or restraint of liberty for a term up to three years, or with arrest for the term up to six months.

2. The same action committed due to improper execution of their professional duties, shall be punishable by restraint of liberty for a term up to four years, or hard labor for a term up to one year with deprivation of the right to occupy certain positions or engage in certain activities for a term up to three years or without such, or by deprivation of liberty for a term up to one year with deprivation of the right to occupy certain positions or engage in certain activities for a term up to three years or without it.

In this case, must adhere to the following conditions:

1. wrongful conduct of a doctor.

2) the Infliction of grievous bodily harm or death.

3) a causal connection between the harm and the unlawful conduct of the doctor.

4) the Fault of the doctor.

At first glance it may seem that to attract a physician to criminal responsibility in the presence of the above-described conditions is not difficult. But it is actually not so simple. Often to prove the fact that there has been unlawful action or inaction of a doctor is quite difficult, and sometimes impossible.

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DEVELOPING SPECIALIZED COMMUNICATIVE SKILLS IN SURGERY AMONG INTERN DOCTORS OF GENERAL PRACTICE

Baizharkinova A.B., Zhakiyeva G.R., Ibragimova N.Z.
Western-Kazakhstan state medical university of Marat Ospanov, Aktobe, e-mail: bayzharkinova@mail.ru

The article presents ways of developing specialized communicative skills on subject of surgery among intern doctors of general practice in dependence on foundation of their training. Nowadays the problem of opportune diagnostics of surgical and traumatic diseases and providing primary doctoral assistance after traumas remains urgent and complicated, especially in regard to doctors of general practice.

Keywords: specialized communicative skill on surgery, general doctoral practice

Profession "general doctoral practice" requires mastership in methods and means of effective patient management, communicating to their relatives and colleagues in order to achieve mutual understanding that is necessary in solving not only treatment and diagnostic objectives, but also personal and family problematic situations that can have a significant effect upon the result of a certain pathology and life quality on the whole.

Developing specialized communicative skills on treatment-diagnostic area of surgery is one of the most important problems and the primary objective in training a doctor of general practice. It provides for a doctor's responsibility for individual and social requirements in accordance with organic unity of knowledge, skills in regard to direct interaction with people and experience in solving new and known professional situational problems.

The problem of developing specialized communicative skills is an object of scientific search in foreign and domestic literature of the XX-XXI century, especially in surgery. Activation of research in this area is related to rising attention towards psychological components of professional activity, search for new means and methods of optimizing success in aspects of diagnostics and treatment [1].

Each doctor of general medical practice must develop their specialized communicative skills towards degree in which their work responds to requirements, placed before the final result of the profession. The final result of their work is the only method of evaluating a doctor's mastership in specialized communicative skills. For example: in differential diagnostics of surgical diseases, positioning non-complicated dislocation of shoulder joint and lower jaw, other dislocations, required according to training programme for interns of general doctoral practice (GDP).

In developed countries of Europe a concept of "International Competence Baseline" – ICB is introduced in this regard. It presents requirements towards knowledge, experience, and personal qualities that form the foundation of certification programmes.

Goal and objective of our work: in order to ensure that future doctors of GDP receive specialized communication skills in surgery and traumatology during their internship training in years 6-7 of education and know that activity of intern doctor (future doctor of general practive) implies:

– necessity to work with contingent of people that suffer from health problems and are in state of emotional discomfort;

– work in intimate area of a person (examination of rectal and vaginal areas among surgical patients) that can cause unintentional tension and resistance;

– necessity to work with patients who do not have any knowledge in medicine and are not able to understand the importance of a certain examination adequately;

– examination of a person who suffers from constant pain, fear, and anxiety (for example: before instrumental examination or direction to surgical treatment);

– influencing psychological state of general practice doctor themselves [2].

Psychological image of "ideal doctor" in eyes of patients includes a number of qualities that describe the former from the position of setting an optimal contact that serves as a guarantee of successful solution of communicative professional problems that define possibility of realizing treatment-diagnostic measures successfully.

According to the revealed specific of GDP intern profession, we can outline requirements towards their mastership in communicative skills on surgery:

– High level of communicative self-control at the foundation of developing specialized profession of doctor;

– Developed tolerant empathy towards humanist attitude to patients of different age, social groups, and status;

– Development of ability to solve conflict situations in a constructive fashion;

– Maintenance of adequate behavior in a conflict situation;

– Developed skills of extracting patients from emotional condition in order to solve medical objectives adequately;

– Trained skills of psychological influence (verbal conviction and infusion) [3].

Developing specialized communicative skills on surgery is vital for an intern during the whole process of their professional activity. Mastering specialized communicative skills is a process of continuous, purposeful, consequent, and stage-based work between doctor and their patients, and must be learned at classes and internship practice of years 6-7 [4]. Training cases "Doctor-patient" are useful in practicing situation problems on surgery, at the same time students obtain experience in diagnostics and differential diagnostics of surgical diseases and treating ambulatory surgical and traumatological diseases. During internship doctors obtain specialized communicative skills of receiving patients in first aid station, receiving rooms, in surgical and traumatological rooms. Particularly, at this stage all skills that were formed earlier, must obtain a stable nature [4–7]. In this regard practical classes also facilitate business games, analysis of solving clinical situational problems, analysis of patients with different cases. A direct observation with tutor's comments on weak and strong aspects of practice stimulates development of specialized communicative skills of intern doctor.

Materials and methods: we have selected two groups of intern doctors who took training in surgery during years 2010 and 2016 with one assistant surgeon in different medical institutions, for example, 10 groups (100 people) in 2010 at the base of policlinic №1 that does not have a separate traumatological room, therefore, specialization in communicative skills could be received only on diagnostics and treatment of surgical diseases. From the graduation of 2016 of 10 intern groups (100 people) took practical training in receiving room, first aid station, and in policlinic rooms. According to statistic data, received in analysis of operating doctors of graduation years 2010 and 2016, 10 % of the latter have become military surgeons, organizers of first aid and policlinics in different cities of Kazakhstan. The research was organized as a phone and e-mail questioning.

Conclusion

The results of questioning (feedback) intern doctors in regard to the received practical skills in surgery, are discussed at department meetings. Doctors of general practice who took training at the base of united railroad hospital and policlinic, have mastered communicative skills in surgery and are able to implement their knowledge in different regions of Kazakhstan as military surgeons, first aid and policlinic organizers.

Sanitary enlightenment during practice, for example, reports of intern doctors on preventing purulent surgical and other types of diseases at sites of railroad production had a significant positive effect upon forming communicative skills.

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COMPARATIVE ANALYSIS OF THE PREFERRED COPING STRATEGIES AND DEFENSE PSYCHOLOGICAL MECHANISMS IN PROSTATE CANCER PATIENTS COMPARED WITH PATIENTS IN OTHER CANCERS

[1]Gardanova J.R., [2]Chernov A.V., [3]Sokov D.G., [4]Abdullin I.I., [5]Hritinin D.F.

[1]Pirogov Russian National Research Medical University, Moscow, e-mail: Zanna7777@inbox.ru;

[2]Pirogov Russian National Research Medical University, Moscow, e-mail: Garciastud@yandex.ru;

[3]GBUZ Clinical Oncology Dispensary number 1 of the Department of Health of the City of Moscow, Moscow, e-mail: sokov77@mail.ru;

[4]Air Force Central Military Clinical Hospital, Moscow, e-mail: iskander.abdullin@gmail.com;

[5]First Moscow State Medical University. th. Sechenov, Moscow, e-mail: chritinin@mail.ru

This paper discusses the results of a study of psychological defense mechanisms and coping strategies in patients with prostate cancer, as well as to compare them with a group of patients with other cancer and the control group. Just study the dependence of the severity of anxiety and defense mechanisms of coping strategies and interpretation of the information obtained. The results can be the basis for the development of rehabilitation program to work with this group of patients.

Keywords: men-s health, mental health, prostate cancer, cancer, oncopsychology

The prostate cancer is the most widespread among other forms of cancer at men in the United States to America. Annually more than 180 000 new cases and 37000 deaths from it are found. In America about 1 billion dollars are allocated for patient care with prostate cancer [1]. In Russia the prostate cancer takes the 6th place on prevalence and mortality among other forms of cancer at men. It promotes number of features of treatment of this disease, such as late diagnostics of disease and lack of psychological patient care [2].

As, the prostate cancer proves severe stress for the man, and in its mentality there are considerable changes. The organism is reconstructed in protective states and its resources will be mobilized to neutralize negative impact of stress. At the behavioral level it is shown in coping-strategy, and at the unconscious level in psychological protective mechanisms.

The coping strategy is individual way of overcoming stress. Allocate constructive coping-strategy and maladaptive coping-strategy can stabilize conditions of sick prostate cancer [3]. To give maladaptive strategy strong internal tension of the patient. For neutralization of negative emotional charge psychological protective mechanisms are used by the person.

These features also define individual types of response of patients to the disease. Someone meets disease face to face and begins fight against it, and someone aims to forget about it [4]. Studying of features of psychological protective mechanisms and coping-strategy at patients with cancer of prostate will allow to create theoretical base for the psychological rehabilitation program

Studying of individual psychological characteristics, such as the preferred coping-strategy and psychological protective mechanisms, for definition of their features of reaction and difference from other oncological patients was the purpose of our research.

Results of research and their discussion

The research included 65 people. From them 40 people have prostate cancer, 25 people of patients with other types of oncological diseases (intestines cancer, cancer of urinary bladder). All patients are men whose average age of 62,4 ± 7,1 years. Suffering from cancer prostates (experimental group) and patients with oncological diseases were at the initial stage of treatment (stage of laboratory diagnostics). Selection of group of patients with cancer of prostate formed on the basis of sex, age, existence of disease and stage of its treatment. Examination was conducted by N to voluntary basis. The research was conducted by questioning method. To find out indicators of such characteristics as levels of situational, personal anxiety, copig-strategy and expressiveness of psychological protective mechanisms techniques “Scale of uneasiness of Spilberger” (7), by “Coping-test of Lazarus” (8) and “Index of Vital style” were used (6).

The purpose of our research – to study indicators of expressiveness of psychological protective mechanisms and coping – strategy at patients with cancer of prostate and group of the people sick with other oncological diseases, and also level of expressiveness of uneasiness and its dependence on psychological protective mechanisms and coping-strategy.

Statistical analysis of data was carried out by means of SPSS Statistics17.0 package, and also the Microsoft Excel program and included descriptive statistical characteristics of selection (arithmetic average, standard deviation) and the correlation analysis which was carried out by means of rank coefficient of Spirmen. Reliable considered differences at $p \leq 0,05$.

As a result of our research it is revealed that at men, patients with cancer of prostate gland the level of personal and situational uneasiness is much higher than normative values of uneasiness. In this regard it is possible to assume that understanding of the disease, fear of the forthcoming procedures and loss of the social status frighten men.

At experimental group, as well as at patients with other oncological diseases, the Denials mechanism is strongly expressed ($\overline{M}$ = 90,6). It is probable that they try to perceive, not to admit the fact that their health is threatened by serious danger to consciousness. It appears, cancer patients have prostates, as well as at patients with other oncological diseases such indicator as "reactive education" is strongly expressed (M = 81,9; M = 83,2). It can demonstrate that these groups try not to allow to themselves information which can do much harm to their social status or health, and also their unconscious fears and experiences come to light in the form of somatic symptoms. But at experimental group the protective mechanism as "Suppression" dominates (M = 95,6) that can demonstrate that this triad promotes and strengthens psychosomatic manifestations [3]. The withheld emotions the "suppression" and "denial" mechanism do not find way out of consciousness of the patient that forces them to pass into corporal form. It is worth investigating in more detail psychosomatic phenomena at this group of patients that to define reliability of this conclusion, by projective techniques.

Correlation indicators between level situational and personal uneasiness with degree expressiveness of protection "suppression" (r = – 0,9876; r = – 0,72901 at p > 0,05) show that it has high performance and holds leading position, in relation to other protection.

Low, in comparison with other values, the indicator of expressiveness psychological the protective projection mechanism at patients with cancer of prostate can say that they are less inclined to attribute the experiences and negative emotions. This fact proves that these patients do not give exit to the experiences, locking in itself negative emotions.

In comparison with other groups, protection "Regression" tells expressiveness about aspiration of the personality in the behavioral reactions to stress and alarm to go to earlier, children's types of reaction. Opening subject of psychosomatic manifestations, the children's type of reaction means somatization because cannot cope with it by means of other, more mature psychological protection. Also it was revealed that use of this mechanism of protection does not lead to decrease in alarm, and on the contrary increases it. (r = 0,7723567; r = 0,6545767, at p > 0,05).

By results of technique of "Coping-test of Lazarus" strong deviations from control group are not revealed. However, at group of patients with cancer of prostate strategy "distancing" is expressed. Most likely, examinees from experimental group try not to be involved emotionally in the problems with health, to underestimate effects and threat to the health. "Positive revaluation" says low indicator of expressiveness of strategy that patients do not see in the disease positive aspects, possibilities of personal growth for themselves. But at the same time at patients with cancer of prostate increase in personal and situational uneasiness when using strategy distancing is observed that testifies to inefficiency of this strategy and at them, as if they did not try to depreciate the diagnosis.

In the analysis of data, it is revealed that patients use such strategy as "search of social support" less often (M = 44,9), however it correlates with decrease by personal uneasiness (r = – 0,51254, at p > 0,05). Other researches showed that men, as a rule, do not prefer to divide the experiences with others though support from the spouse does them by surer [6].

Conclusions

Thus, it was revealed that at group of the people having the diagnosis prostate cancer, high level of personal and situational uneasiness. For its suppression they use preferential such protective mechanisms as "Suppression" and "Denial", unlike control group. This acquired information demonstrates that at this group is much higher risk of psychosomatic disorders, than at patients with other oncological diseases. At the behavioral level it is confirmed by results of research of system of coping-strategy of patients. Men address for social support less often, but its receiving reduces their uneasiness.

From everything is higher than told follows that patients with cancer of prostate need to create absolutely new system of psychological rehabilitation which will rely on the received results. This program has to include integrated effect on mentality of the patient, work with

its a close social circle, especially with the spouse. Main objectives for work are the high level of uneasiness, the suppressed emotions and unwillingness to accept support from the relatives. It is also necessary to study more profoundly existence at this group of people of psychosomatic diseases.

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COMPARATIVE CHARACTERISTICS OF HISTOMORPHOLOGIC CHANGES IN THE SMALL INTESTINE OF RATS EXPOSED TO GAMMA– AND NEUTRON RADIATION

[1]Uzbekov D., [2]Hoshi M., [3]Shichijo K., [1]Chaizhunusova N., [1]Shabdarbaeva D., [1]Sayakenov N., [1]Kairkhanova Y., [1]Saimova A., [1]Apbasova S.

[1]Semey State Medical University, Semey, e-mail: Med.lib.53@mail.ru;

[2]Research Institute for Radiation Biology and Medicine, Hiroshima, e-mail: mhoshi@hiroshima–u.ac.jp;

[3]Atomic Bomb Disease Institute, Nagasaki, e-mail: shichijo@nagasaki–u.ac.jp

For a broader understanding of long–term radiation pathology continues to represent the interest studying the patterns and degree of severity of intestinal structural changes and also its effects on occurrence of pathological processes in small intestine of human exposed to different type of radiation. The most prominent microscopic changes characterized by presence the signs of inflammation and degeneration on the 3rd and 14th day, in particular, in ^{56}Mn–exposed rats compared to rats from MnO2 and ^{60}Co groups. The study results showed that in majority of experimental animals exposed to γ– and neutron radiation more pronounced changes were observed on the 60th day after exposure, consisting the appearance of chronic inflammation and foci of necrosis, whereas in MnO2–inhaled rats dominated degenerative changes. The findings support a role of ionizing radiation in the formation of small intestinal damage depending on both dose and type of radiation.

Keywords: radioactive 56Mn, γ–radiation, small intestine, morphologic changes, rats

It is known that among the neutron–induced radioisotopes ^{56}Mn is a dominant element found after an A–bomb explosion. Since ^{56}Mn and the other neutron–activated radioisotopes were present in dust after bombings, people have inhaled these radioactive materials and been internally exposed to radiation. People who returned early to Hiroshima and Nagasaki after A–bombing were reported to suffer from the symptoms of acute radiation effects [3]. Thereby, increasing attention has been given to the radiation effect on the gastrointestinal (GI) tract due to concerns about exposure to radiation after an accident [10]. It is known that nuclear factor is pronounced in GI tract those that are exposed to the external environment, therefore one of outcomes of radiation effects is GI–syndrome [1], which characterized clinically by haemorrhage, endotoxemia, bacterial infection, anorexia, nausea, vomiting, diarrhoea, loss of electrolytes and fluid, dehydration, systemic infection, septic shock and even death. In spite of the significant advances that have occurred in research on underlying mechanisms over the last two decades, the overall morphogenesis of the GI–syndrome still remains unclear. Currently, according to morphologists, these symptoms are probably due to a rapid modification of the intestinal motility and to the structural alteration of the intestinal mucosa (cell loss and altered crypt integrity) [8]. The highly radiosensitive intestine is an important dose–limitative organ in both total body and abdominopelvic radiation [2]. Most of studies regarding the fast neutron effect have focused at intestinal changes [4]. Currently, particular interest is a comparative characteristic of microscopic changes in the small intestine of persons exposed to ^{56}Mn and ^{60}Co, allowing in the future to work out the diagnostic criteria for assessing of radiation effect factor on the GI tract, depending on the cumulative dose.

Objective of the study: identify and compare the microscopic changes in the rat small intestine after exposure by single dose of γ–radiation and neutron–activated ^{56}MnO2 powder.

Materials and methods

For this study, it was purchased and raised in a specific–pathogen–free facility six–month–old both sexes "Wistar" rats in an amount of 36 with mean whole body weight 220–330 g. All experimental animals were acclimatized for 2 weeks before initiation of experiments and kept under normal conditions and fed pellets concentrated diet and vitamin mixtures. They were maintained at constant temperature (22 ± 1 °C) on 8 hour light–dark cycle.

The rats were allocated into four groups. The first group of animals (n = 9) were subjected to ^{56}Mn which was obtained by neutron activation of 100 mg of manganese dioxide (MnO2) powder using nuclear reactor ("Baikal–1") with neutron flux 4×10^{14} n/cm². Activated powder with total activity of ^{56}Mn 2.75×10^{8} Bq was sprayed pneumatically over rats placed in the special box. The moment of exposition beginning of experimental animals by ^{56}Mn powder is 6 minute after finishing of neutron activation. Duration of exposition of rats to radioactive powder was 3.5–4.0 hours (starting from the moment of spraying of ^{56}Mn powder till surgical extraction of the small intestine). The second group of rats (n = 9) were exposed to not irradiated MnO2. The spray powder was carried out in a chemical box, which contained boxes of 9 rats. Each portion of MnO2 was sprayed in box with lots of biologic objects. Then unirradiated powder and incubated biologic objects in a container for hour. The third group of rats (n = 9) were irradiated with a single dose of

2 Gy was performed at a dose rate of 2.6 Gy/min using ^{60}Co γ–ray by czech radiotherapeutic device "Teragam K–2 unit". During the exposure, animals were placed in a specially engineered cage made of organic glass with individual compartments for each rat. Irradiation doses were monitored using Accudose (Radcal) to deliver the exact dose to each animal. After irradiation, rats were taken back to the animal facility and routinely cared. The fourth group consisted of control rats (n = 9) which were placed on shelves in the same facility and shielded from radiation. All animal procedures were approved by Ethical Committee of Semey State Medical University, Kazakhstan (Protocol №5 dated 16.04.2014) in accordance with Directive of the European Parliament and the Council on the Office in animals protection.

All animals were anesthetized with an intraperitoneal injection of 100 mg/kg of ketamine hydrochloride. The rats were sacrificed on the 3rd, 14th, 60th day after irradiation and the small intestine was immediately surgically extracted for further histological study. A section from the small intestine was fixed in 10% formalin, embedded in paraffin wax, sectioned serially into 4 μm thick sections, and stained by hematoxylin–eosin (H&E). The specimens were examined under a Leica DM 1000 microscope (Germany) and images were captured with a charge–coupled device camera (Visitron Systems, Puchheim, Germany) at ×10 and ×40 magnifications. Qualitative histological assessment of intestinal injury was carried out to obtain an overall damage severity result.

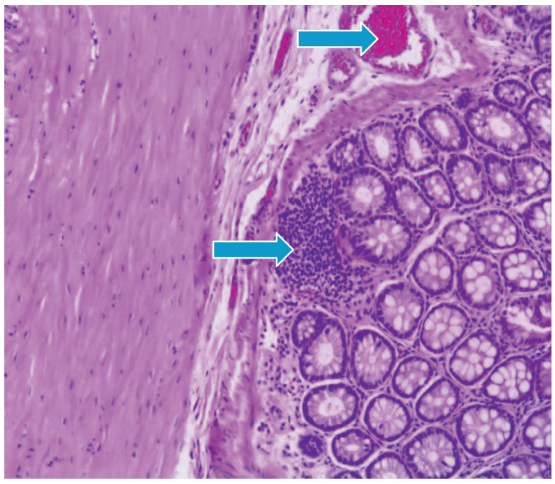
Results of research and their discussion

To assess the health of rats after radiation, we evaluated activity, posture, dehydration and pelage of the rats. Radiation induced a decrease in health score in all groups of irradiated animals.

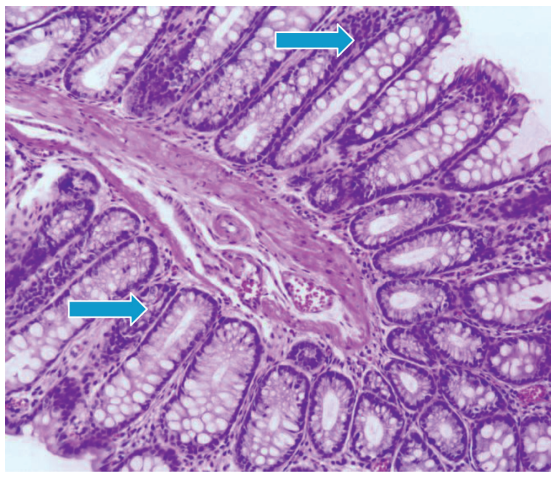
We performed experiment with neutron–activated ^{56}MnO2 powder exposed rats. Although the level of radioactivity received from ^{56}Mn was rather low, the observed biological effects were consistent in experiment. It was previously reported the internal dose estimates in organs of ^{56}Mn–exposed rats. The highest doses were recorded in the small intestine [9].

Algorithm description of slide glasses of the small intestine included: presence of layers of the intestinal wall; degree of vascular hyperemia; state of mucosa, submucosa, muscle membrane and serosa. Light microscopic examination of the intestinal mucosa of control rats showed a normal architecture of villi, crypts and enterocytes. Intestinal tissues were collected at day 3, 14 and 60 post–radiation, time associated with complete crypt ablation in small intestine after radiation exposure. H&E sections of intestine revealed no damage in control groups. However, in segment radiated rats, partial loss of crypts was observed exclusively within the targeted segment, while the rest of the intestine was unaffected.

The study of slide glasses of the small intestine in rats on the 3rd day after ^{56}Mn effect shown presence the severe degenerative changes of glands, mild accumulations of leukocytes in the stroma and uneven hyperemia of the stromal capillaries (Fig. 1–A), whereas in MnO2–inhaled rats observed only mild leukocytic infiltration. In rats exposed to ^{60}Co was found focal accumulations in the glandular lumen the cellular elements, preferably desquamated epithelial cells and cells of reactive nature (Fig. 1–B).



A



B

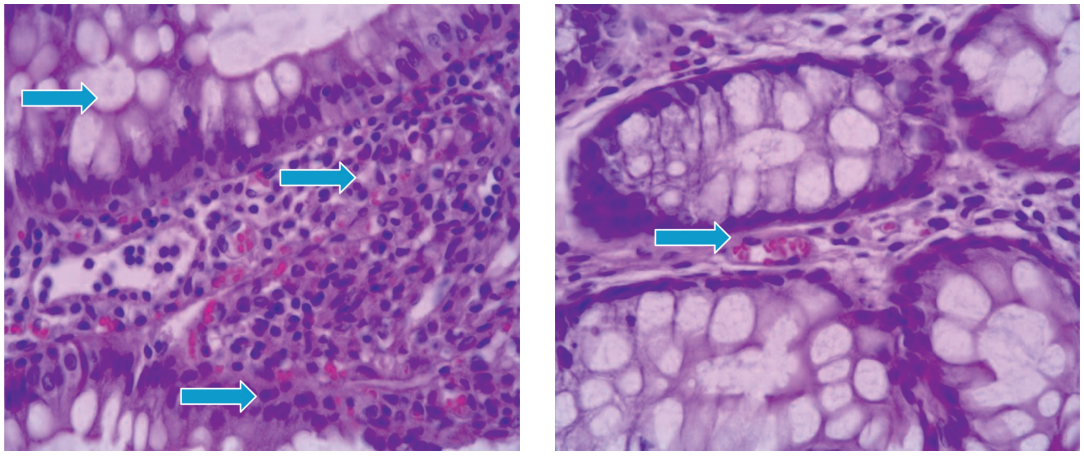
Fig. 1. Photomicrograph of the small intestine in ^{56}Mn–exposed rat (A) and ^{60}Co–exposed rat (B). H&E staining, original magnification ×10

Microscopic picture of animals on the 14th day after ^{56}Mn exposure provided on fig. 2–A, where we drew attention to the presence of gaps semi–collapsing glands with degeneration, as well as optically empty vacuoles in the glands. Mild cluster of cellular elements, predominantly leukocytes. Considerable importance should be given to presence in the lumen of the individual

glands accumulation of lymphocytes, modified leukocytes, mainly neutrophils. Figure 2–B shows that MnO2 effect caused sign of degeneration severe swelling of the mucous membrane of the stroma and mild erythrocytes stasis. Histological studies of ^{60}Co–exposed rats revealed radiation–induced prominent degeneration. Moreover, we are registered the inflammatory response manifested by moderate of macrophages and lymphocytic infiltration in the stroma of the mucous and in lumen of some glands.

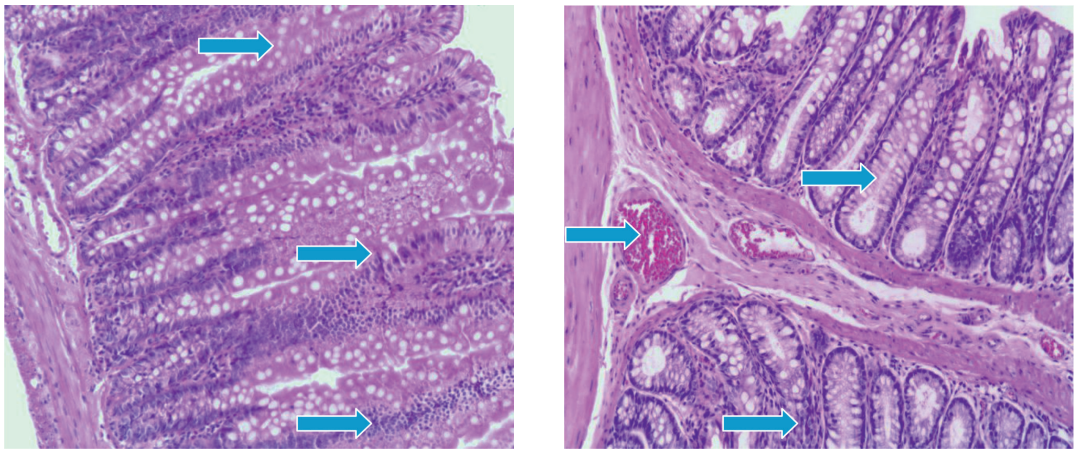
Fig. 3–A shows that neutron radiation effect induces on the 60th day moderate severe degenerative changes of the mucosa and submucosa. The sections are represented mainly by edematous stroma. Epithelial glands exposed to collapse, in the lumen observed mild accumulations of cellular elements with a predominance the neutrophils. The glands are shrouded by optical empty vacuoles.

Mostly celebrated the formation of necrotic foci. In contrast to the external γ–radiation and internal ^{56}Mn radiation, inhalation of not activated manganese in rats intestine after 2 month contributes to the appearance narrowing and swollen glands, epithelial desquamation of some glands. Regarding experimental animals exposed to γ–radiation it should be noted the presence of marked degenerative and necrobiotic changes of surface mucous layer and uneven hyperemia of vessels. Here and there observed the foci of necrosis and reactive changes in the mucosa (Fig. 3–B).



A B

Fig. 2. Histologic sections of the small intestine in ^{56}Mn–exposed rat (A) and MnO2–inhaled rat (B). H&E staining, original magnification ×10 and ×40



A B

Fig. 3. Light microscopy of ^{56}Mn–induced (A) and γ–ray–induced rat small intestine (B) H&E staining, original magnification ×10

Group	Pathological process	Day 3	Day 14	Day 60
^{56}Mn	Inflammation Degeneration Necrosis	2 (+~++) 3 (+~++)	3 (++) 3 (+~++)	3 (++) 2 (+~++) 2 (+~++)
MnO2	Inflammation Degeneration Necrosis	3 (++)	2 (+~++) 2 (+)[1]	2 (+) 2 (+)
^{60}Co	Inflammation Degeneration Necrosis	2 (+~++) 2 (+~++)	2 (++) 2 (+~++)	3 (++) 2 (+~++) 2 (+~++)
Control	Inflammation Degeneration Necrosis			

N o t e . 1 – Incidence and pathological grades (in parenthesis).

The above data are consistent with our study results the small intestine in both ^{56}Mn– and ^{60}Co–exposed rats showed a similar changes. Nevertheless, according to results of histologic examination most pronounced changes were observed in the small intestine of rats from ^{56}Mn group, indicating that neutron radiation has a significant biologic effect on examined organ (Table).

In this study, we have shown the sequence of morphologic changes in the rat small intestine from early to late stage after a single influence of ^{56}MnO2 and ^{60}Co at 2 Gy dose, which were the initiators of radiation–induced intestinal injury (RIII). Results of morphologic studies have shown that structural changes in the small intestine observed in irradiated rats little differed from the previously published results using different radiation models.

Currently, great importance is attached to the role of Mn, inducing cell death. Experimentally confirmed that a certain percentage of Mn enters to organism through absorption in the GI tract. If Mn not absorbed in the stomach, it is rapidly absorbed in the small intestine. Thus, in the literature we have examined papers revealed regarding ability of Mn to cause histomorphologic changes in the small intestine of animals [6].

In segment–radiated rats, the radiated intestinal segment was still identifiable by H&E staining at day 14 post–radiation and did not exhibit complete normalization of architecture of the mucosa and bowel wall as compared with non–irradiated tissue adjacent to the radiated segment. Histological analysis showed that radiation could induce epithelial degeneration, which is characterized by the loss of intestinal structural integrity, at day 14 post–radiation. A complete understanding of the mechanisms driving epithelial regeneration and repair, as well as the complications due to exposure of the small intestine to ^{56}Mn would benefit from the ability to study later phases of regeneration involving intestinal epithelial hyperplasia and hyper–proliferation and ideally, times associated with complete normalization of the intestinal epithelial architecture.

It is known that mechanisms of injury in normal tissues after irradiation include progenitor cell depletion, microvascular injury, inflammation and cell death [5]. The major pathological change caused by RIII is architectural disorganization, including inflammatory cell infiltration, villitis, desquamation and necrosis [7]. Several evidences suggest that radiation-induced dysfunctions and either changes in subcellular, cellular, and histological structure of the small intestine are mediated by concerted and interrelated changes of a plethora of various extracellular mediators and their intracellular messengers [8]. Data morphologic findings were consistent with radiation enteritis. Morphological damages of radiation–induced enteritis were known as architectural changes of intestinal mucosa such as villus shortening by cell death. The acute microscopic changes of intestine by irradiation were consisted of structural changes in the villus–crypt architecture and epithelial transformations associated with radiation–induced apoptosis [2].

Although whole–body radiation doses from ^{56}Mn were relatively low, higher internal doses were noted in the small intestine, in addition to significant pathological changes that were more severe and prolonged than the effects of ^{60}Co γ–irradiation. It should be noted that the most prominent microscopic changes were detected in ^{56}Mn–exposed rats after 2 weeks.

These data may indicate the potential for a high risk of internal exposure to ^{56}Mn, which would have existed in airborne dust after A–bomb explosions in Hiroshima and Nagasaki.

Summing up, whole–body radiation can cause severe damage to the GI tract, causing inflammatory processes and immediate cell death. Radiation causes inflammation and dysregulation of immune homeostasis. These histomorphologic changes in examined organ of rats exposed to γ– and neutron radiation make it possible to develop diagnostic criteria for assessing of radiation effect on the small intestine, depending on cumulative dose.

Conclusion

In conclusion, the most prominent histologic picture characterized by presence the signs of inflammation and degeneration on the 3rd and 14th day, in particular, in rats exposed to ^{56}MnO2 compared to rats from MnO2 and ^{60}Co groups. Our research results and their comparison with literature data led to the conclusion that majority of experimental animals exposed to γ– and neutron radiation more pronounced changes were observed on the 60th day after exposure, consisting the appearance of chronic inflammation, signs of degeneration and foci of necrosis, whereas in MnO2–inhaled rats dominated degenerative changes. Consequently, like γ–rays, ^{56}MnO2 also promotes activation of inflammatory processes and stimulation of immune responses manifested by cellular infiltration.

Thus, our data obtained from in vivo experiments provide strong evidence that neutron radiation causes formation of morphologic features which typically for radiation enteritis, that is a form of small intestinal injury, depending on both dose and type of radiation.

The work is submitted to the International Scientific Conference “Diagnosis, therapy, prevention of socially significant diseases in humans”, UAE (Dubai) March 4–10, 2017, came to the editorial office on 24.02.2017.

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Short Reports

ABOUT SEVERAL CRITERIA OF CHILDREN HEALTH ASSESSMENT

Krukovich E.V., Kablukov D.A.
Pacific State Medical University, Vladivostok, e-mail: Kablukovdenis@mail.ru

This article briefly shows the results of the study of neuropsychiatric health of children. The research was conducted in Vladivostok, Russia. The article demonstrates the statistics of psychiatric and behavior disorders in 2014 and 2015 as well as a number of neuropsychiatric health indicators occurring in children in different age groups.

During the recent decades pediatric doctors, hygienists, physiologists, psychologists, and pedagogues have been worried by a significant degradation of health condition amongst the upcoming generation. Monitoring basic indicators of realizing measures on preventive examination of juniors is still underway in Russia. According to the data of federal service of state statistic, in 2015 21,3 million juniors in age of 0 to 17 years old were taken to preventive medical examinations. Among all of the examined juniors, I group of health condition was registered in 29,8 % of cases, II group – in 54,8 %, III group – in 13,2 %; IV and V group – 1,4 % and 0,8 % correspondingly. One of criterions in evaluating health group is evaluation of nervous – psychic health (NPH), evaluation of which has caused certain complications up to current moment, regardless of fact that disease rate according to nosologic form F00-F99 (MCB-10), as well as psychic and behavior disturbance had a certain trend towards growth. Thus, index of initial disease rate for this disease group increased by 3,3 % and equaled 362,9 per 100 thousand of population in Primorsk region in 2015 against 351,2 in 2014. A significant growth in value index (by 16,7 %) was registered in group – children up to 14 years of age (from 533,0 per 100 thousand of population in 2014 to 621,9 in 2015), and this fact requires additional investigation and development of prevention measures.

We have undertaken evaluation of NPH 1024 among children from 7 to 17 years if age in the city of Vladivostok according to separate NPH criterions that allowed us to exclude ghastly oscillations on the side of NPH. Somato-vegetative, vegeto-deincefal, and psychomotoric areas has been studied. An additional question list according to European project of school research ESPAD (Group POMPIDOU of European Council) was implemented in group of 14–17 years of age. All children who participated in the research, were referred to health group 1 and 2. Estimation of the received results was carried out via method of variation statistic. Statistic procession of the received material was done with specialized packs of applicatory programmes for researchers ("Statistica 6.0, 8.0").

While evaluating separate indicators of NPH among children of 7–9 years of age we have registered the highest occurrence of sign "mood" according to somato-vegetarive index. Children more often had a good, stable mood, as well as good appetite – 22,9 % of cases, whilst this index was 1,6 times lower among children of 15–17 years of age, and it reflected appetite decrease. This fact was supported by indicator "presence of fears" and "sleeping" (they were higher in this group than among children of other age groups by 15 % and 11,4 %) , they reflected a high level of neurotic condition. Children of this age group according to their vegeto-diencefal indicators suffered more frequent headaches, exhaustion, difficult endurance of heat, loud noise, bright light, dizziness, collapses. Probably, this fact was defined by strain in educational process. They had a good, stable mood according to indicators of psychomotoric area and intellectual development, less expressed were behavior deviations, compulsive motion, pathological habits (9,1 %, 7,3 %, 10,9 %). Analysis of NPH indicators in group of 10–14 years of age revealed some separate extreme deviations from the whole selection, but all studied indicators were placed within limits for the age group. A special anxiety is caused by teenager group of 15–17 years of age, among which decrease in appetite was registered in 7,9 % of cases according to somatovegetative indicator, and exhaustion – in 7,1 % of cases according to vegeto-diencefal indicators. According to indicators of psychomotoric area and intellectual development increased affectability, aggressiveness, motion disinhibition, restraint, inclination to lies, unfriendly attitude towards close people were the most frequent effects. An additional analysis should be carried out upon the factor of "bad habits" (biting nails, tearing-off hair, rocking head and body) as in most cases teenagers did not indicate their presence. Questioning according to ESPAD allow us to conclude that in Primorsk region, in comparison to indexes of Russian Federation, decrease in basic narcological parameters is observed: smoking rate is 2–3 times lower, beer consumption is lower by 3, youngster try cannabis preparations 2 times less frequently than average in Russia. Thus, evaluation of NPH in complex estimation of health condition among children has a great significance and requires detailed investigation and development of prevention measures.

TRENDS OF MODERN EDUCATION IN A MULTICULTURAL UNIVERSITY

Kirgueva F.Kh.

Federal State Budgetary Educational Institution of Higher Education "North-Ossetian State University named after Kosta Levanovich Khetagurov", Vladikavkaz, e-mail: kusu@yandex.ru

Education determines the level of the current socio-economic development of the state. Modern cultural situation strongly requires substantial revision of traditional educational paradigms that have proved untenable today in terms of development of any civilized society. The level of training of primary school teachers and their activities in elementary school allow us to speak about the insufficient number of teachers, capable at high professional level to solve complex modern problems of education. Primary school practice dictates high school the requirements for training primary school teachers, working in conditions of polylingual educational environment.

Keywords: education, modernization of education, culturological approach, multicultural educational space, multilingual environment education, preparation of primary school teachers

The value of education is determined by its competitive ability in the formation of the citizen, personal and professional, impact on the political sphere of public life.

The idea of creating a single European space of higher education described in Bologna Declaration identified common challenges in designing a single model of higher education [1].

Analysis of trends of modern education allows us to distinguish two global processes – confrontation of educational systems to each other and their interrelation and complementarity, expressed by the processes of diversification and internationalization.

the challenges of globalization greatly influence on multinational and multicultural Russia, and problems of intercultural communication in the last two decades has become extremely relevant [3]. Nowadays, a completely new type of teacher is established in the world social space, which is "able to focus on the needs of the individual, to change the life of society, to understand another culture, to bear the social responsibility to the individual for the quality of education" [4].

Being a multinational state, Russia determines the specifics of multicultural educational space, based on the revival of the intellectual and creative potential of the nation, integration of the individual into the international space. The cultural approach claims new universals: spiritual one, revealing the creative man and his life's ideals system; humanistic, claiming human's nature; communicative, requiring the knowledge of himself and others; active, creating conditions for self-realization [5]. Based on the foregoing, the issue of the educational space of higher school modernization as a training environment for new type of primary school teachers with advanced moral and communicative abilities that allow him to become mobile in the modern market of educational services becomes very important.

In the conditions of modernization of education in the context of multicultural educational space there is a need for the development of new competencies of future primary school teachers due to the creation of high-quality information environment that activates the students to learn new means of communication: methods of communication, language culture, ideas about the logic of construction, the structure of the information arrays, the fundamental working skills with texts and others [3].

Designing of polylingual environment education of future primary school teachers creates a new multinational and multicultural space, which provides to each of them the conditions for self-development. E.V. Bondarevskaya notes that the culturological approach as a methodological basis of designing the content and methods of education is "crucial for the development of education and the necessity of its implementation in the context of culture" [2, 6].

Quick change of the situation in the world and educational space lead to the necessity of multileveled education, which means the education of man through all his life, during which his needs in self-education come true. This understanding of graduate education dictates the need of the revision of the content of preparation of primary school teachers – the accumulation of such competences that would allow him constantly to enlarge his experience with new competences, depending on the prevailing educational situation in the region, at school in the context of multilevel and competent approach. Transformation from the traditional model of specialist's training to the multilevel one actualizes the problems of the professional community orientation on adoption primary school bachelor of education and the need to

change the content and technology of primary school teachers training in the conditions of multilingual education in the region and world trends of the development of competences of higher education graduates.

In the context of higher and elementary schools modernization the priorities in primary school teachers' training at the undergraduate level are: the creation of an integrated multilevel system of primary school teachers' training based on new ideas of modern education, developing in the context of Bologna agreement; the development of primary school teacher competences containing linguistic, professional, communicative and information modules corresponding to modern types of schools and requests of students for the education; integration of modern technologies changing learning environment of personal and professional development of students into the bachelors studying according to the "Primary education" profile; up-bringing of tolerant primary school teacher personality, which is able to respect the dignity of each student.

The analysis of the researches and experience in training primary school teachers in various Russian universities showed that the problem of bachelors training on the "Primary education" profile remains relevant and poorly developed in the system of multilevel education.

Modeling of the pedagogical education content on the basis of the competence approach requires the selection of pedagogical competences, reflecting the many subject relations in primary school educational process, pedagogical patterns, which ensure the quality of primary school pupils' training.

The content itself is aimed at the formation of relations to the universal and national culture values, the development of needs to explore and design personal and professional life within the boundaries of those values (preserving the best traditions of Russian education with its values: identity, activity, solidity, etc.), the cultural-historical experience of the peoples of the republics for which a primary school teacher is prepared. All this allows to open new possibilities in the world experience knowledge, revealing the horizons of the knowledge of new technologies and cultures, and providing teacher mobility and flexibility in educational services market.

Culturological approach to the modernization of education reinforces the humanistic context of primary school teachers' education, defines the cultural bases of multilingual environment and the development of personality in it. On this basis, high school aims to prepare a new type of primary school teacher, able to interact with the culture, learn it, and act as a carrier of values and behavior patterns of a specific culture, create a new communicative culture in the professional environment and in the system of relations "teacher-student".

Modern researches of the problem of primary school teacher training reveal the prevailing concept of development of pedagogical education, e. i. activity approach, ensuring the formation of the means of self-determination and self-building; learner-centered approach that changed the attitude to the education system and put in the forefront the interests of the student; humanistic one, which oriented the content of education and teaching technologies on the development and education of the individual. The focus of education on culture filled it with human meaning and values (people, culture, creativity, growth, individuality, community, etc.) that made the content of teacher education, helped to develop new requirements for the training of primary school teachers which are able to integrate in any socio-cultural and educational space. The development of pedagogical education system should act as a guarantor of the viability of the whole educational system and of the individual as a customer of qualified educational services, changing according to the demands of the region.

Analysis of modern researches on problems of training of future teachers allowed us to highlight the directions which are the most important for our research, identify approaches to designing regional and multilingual competence model of primary school teachers training: the educational environment of the University in the development of the social functions of a future teacher, the forming of transformation ability of new knowledge into the teaching staff; modernization of curricula and programs aimed on students' training forms; training and methodological support of students educational activity; interdisciplinary relations in the coordination of content and students' methods of teaching; the organization of independent activity of students; special courses and workshops in educational process at the correspondence departments of universities; professional training of primary school teachers in the system of distance teacher education; primary school teacher training in the conditions of multicultural education.

One of the aspects in the researches of this kind is the question about students' readiness for the creative professional-pedagogical activity – future primary school teachers in the

conditions of multilingual educational environment. The ideas of the Bologna agreement calls for new approaches to the education content taking into account three components: international, national and regional components in the specific conditions of regional development. Primary school teacher is required the development of a communicative culture and social interaction, the ability to unite children in the community to achieve general results and individual success. As the study showed, in the bachelors training at the "Primary education" profile, it is necessary to focus on such a high school graduate, whose diploma could guarantee him a certain career, a high position in society, the creation of original concepts, programs of training and education of younger students as an indicator of creative activity of teachers. Today, the teacher is required not only obtaining a high education diploma, but also a high degree of responsibility for the quality of its activities, the ability to control it, to learn new related skills. This motivates us to search the ways of upgrading of primary school teachers' training at the undergraduate level in accordance with international and national-regional requirements.

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CREATIVE THINKING AND COMPUTER GRAPHICS AND ANIMATION IN EDUCATION

Zhunussova L.Kh., Anuarbekova G.Zh.
Kazakh National Pedagogical Universitety named after Abai, Almaty, e-mail: khafizovna_66@mail.ru

Computer graphics and animation today – the most powerful creative tool for creating a visual product and a powerful tool of visual thinking. At the present time in connection with the implementation of the educational practice means of new information technologies there is a real opportunity to teach students of computer graphics and animation. In this paper, the problems of teaching computer graphics as an academic discipline. The author examines some of the methods contributing to the development of creative thinking . Relevance of article is connected with contemporary changes in the field of methodology of teaching, using interactive teaching methods.

Keywords: teaching methods, critical thinking, interactive methods, teaching activities, methods and means of teaching

Animation is one of the favorite genres in children and adolescents. Surveys of students show that among the most popular television programs animated films take tenth position out of forty. The power of this art is that it does not require translation into other languages, feel free to paves the shortest distance from idea to image. Computer animation, expanding the capabilities of traditional, allows you to do anything fancy person, or to mimic what exists in nature. Therefore, computer animation is of particular interest to schoolchildren even in some other software.

The elective course in computer animation, announced, among many other computer electives, usually (in the experience of many teachers) collects the greatest number of applicants. However for successful work in the field of animation it is necessary to develop in students a special warehouse of mentality, thinking, imagination, when the artist feels an inner need in a dynamic, temporal development of the image, the idea which gives animation.

Today in General education and vocational training still image, "busy" computer models and other types of computer animations used in training and testing simulators-simulators for training pilots, astronauts, captains and drivers. Computer animation and use scientists if there is a need to replace it experiment model simulation. That is, the experience of the diverse applications of computer animation in various fields large enough. The development of the computer industry in General, along with the computerization of schools and universities produced in recent years have led to a significant increase in the number of young users of personal computers. As a result, the system of our education is now at a new stage in the introduction of computer technology.

As you know, the computer is a magnificent tool for the simulation and demonstration of the laws underlying artistic, scientific and technical creativity, as a means of creating new artwork and even new types of art, as well as personalization of the educational process.

In General, progressive is considered to be educational technology, which is focused on rational and critical analysis of obtained information. Progressive teachers build learning by problem-oriented models; they appeal to children's natural curiosity about the nature of things, guiding students through questions and facts, requiring children to independent research. Group problem solving and discussion to encourage the designation and resolution of cognitive problems and the intellectual development of students. In teaching computer animation with the accounting group and the creative nature of the work on the animated film, you must use the possibility of development of communication and sociality of the students, solve their psychological problems, since the advantage of a group context is the ability to receive feedback and support from other people.

There are several traditional schemes of computer education, namely: "Autonomous" model of education, the independent aim of the study is for each student; "in-competition" model, when the same goal is put in front of every student; "co-operative" model, where the common goal is of the whole group, and roles during a task, students allocate themselves.

However, if the execution computer of the film or job on the computer that requires concentration of attention, speed of responses and a particular individual strategy of behavior, individual work is still preferable group, as in this case, in the group of children begin to be distracted or conflict. So the quick test on knowledge of the entertainment package is better model of "one student – one computer", and when the problematic study of the same package or creating a movie are the advantages of working in group or pair.

In particular, with all the advantages of the process of computerization of education, there is a real danger as if about information technology learning when working with communication in various school and University subjects becomes an end in itself, not a means of achieving educational goals.

This problem includes the fact that the advent of modeling programs has led to the emergence of managed virtual worlds in which the computer simulates some of the real or imagined world, providing the opportunity to act on it and see what happens. Simulation programs create rich opportunities for accumulation of individual experience of students. However, in constant communication with the screen the student ceases to adequately perceive the reality. Life is presented not for what it is, but how to create communication tools. Both of these problems when dealing with computer animation to create a clear and present danger to the students. Meanwhile, visual thinking is an essential component of educational technology. The fact that the separation of education from direct experience led to the development of "visual learning" in the highest degree useful in order to give content to the words, which are for memorizing and learning by students. However, the use of visual material cannot in itself lead to visual thinking primarily for two reasons. First, visual thinking is not only to use concepts for which there are specific counterparts. Visual thinking, as understood by experts – it is thinking through visual operations. In other words, the work of art is not an illustration to the thoughts of its author, and the ultimate manifestation of thinking.

Everything and everywhere resort to visual thinking. Nevertheless, teachers and psychologists still often won't or don't want to admit that the processes of perceptual thinking as difficult and productive, require an equally large brain, and the use of intellectual concepts.

Meanwhile, the thinking, itself, will never lead to any knowledge of external objects. The starting point of all research is sensory perception. The validity of theoretical thinking is achieved through its connection with the whole amount of data of sensory experience. Not only this recognition, but many other facts confirm the primacy of imagery and visual thinking and lead to thoughts about the need to develop teaching methods work with images (their perception, verbalization, analysis, etc.) and confirm the need for this technology in the education system.

In favor of the study of visual thinking in the media on the material of computer graphics and animation illustrated by the fact that the blueprints and drawings, is intentional translation of the object in visual form, often more effectively perform the function of interpretation than approximate and partly random shapes photos. Computer animation helps to connect this more General structure of the image with the extension of view and, consequently, the expansion of consciousness that allows us not only to see the eyes of another, all he can not to pass us on the logically-verbal level. In modern parlance, we can recreate inaccessible or invisible to the eye of the world. Competent use of computer graphics and animation in teaching school subjects can simultaneously reach and improve the efficiency of learning a particular subject. Software computer graphics and animation can, for example, significantly increase the visibility of learning, to expand opportunities for feedback and individual work, to give access to a variety of information . The teacher should explore and exploit opportunities includes specific tools for their subject. In any case, the modern youth spends a lot of time in communicating with the media computer animation: the purpose of education is to transform this communication into a positive experience for personal development and learning.

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GENERAL THEORY OF DIVERSITIES AS ONE OF THE MOST IMPORTANT PARTS OF THE UNIVERSAL CURRICULUM CORE

Romanenko V.N., Nikitina G.V.
North-Western Branch of Academy of Information Technologies in Education, Gatchina, e-mail: putyatino1941@gmail.com

Creation of a convenient and user-friendly scientific terminology is discussed. Special attention is given to creation of scientific terminology in the field of natural Sciences. Such terminology should be understandable not only in Russian literature but also in the language of international scientific communication. The main causes of difficulties in translation of scientific terms from Russian into English and Vice versa are discussed. Several terminological problems associated with the concept of information and concepts that describe the pedagogical process are studied in details. Authors provide a number of practical recommendations and clarifying assumptions.

Keywords: Commmunication, competency, context, information, matter, perseption, semantic meaning, substance

Knowledge, which an educated person should have, consists of *Universal Curriculum Core* or *UCC* and an actively developed shell. It consists of a series of content specific areas [1]. UCC has a central core with *Primitive Knowledge*. A layer with *Basic Knowledge* is located around it. The set of fundamental Laws of Nature and Humankind are one of the most important parts of this knowledge layer. Updates of the data collected in the layer of Basic Knowledge go much slower than in the areas of content specific information. These updates do not run evenly. At this point of time the update of the laws describing diversities of Nature is one of the relevant problems in building modern instructional technologies. The brief discussion devoted to the selection of the most important laws of diversities in order to include them in modern UCC is a goal of this issue.

The starting point in learning the Science of diversities is a well known fact that the Universe is not homogeneous. Its parts can be called *Objects*. They are in constant interactions with each other. It is possible to call them all *Essences.* Each Object has definite dimensions. They can also exist at any interval of time. Ideal chaos without beginning, and fixed end, and without definite dimensions is only an ideal imagination, which cannot be realized. Therefore, a good philosophy must study models of the Universe or its parts, which can be described in terms of their deviations from ideal imagination [2]. People's orientation in the world requires comparing properties of different matters. This forces a person to search for matters with similar or equal properties. The entire human behavior essentially relies on the assumption about the possibility of intelligent reactions, which are the same under the same conditions. It is intuitively clear that the same conditions may be provided by the sameness of matters. The properties of each of them depend on the way of measuring its value. If one wants to estimate any property numerically he (she) must have a matter which possesses this property, also. Then it is possible to compare these properties. Obviously, one must have additional matter, which is used for comparison. The first conclusion from this analysis is the following approval:

To have any numerical estimation of any matter it is necessary to have no less than three independent matters.

What does it mean when we say that two entities are fully identical? It is possible only when a set of all possible properties of these matters, both numeric and qualitative are exactly the same. From the ancient times it is known that if two matters **A** and **B** have so called *Strict numerical identity***,** all their properties must be the same. It is written in [3] ***Leibniz's Law*:**

If A is one and the same thing as B (that is, A is numerically identical to B), then every property that A has, B also has to have, and vice versa [4].

The main conclusion from this is the following ***Statement***:

In nature there are never two beings which are perfectly alike. As a result, it is possible to say: *Two objects (things, goods and even a number of actions) can never be fully identical.* Soma time one says that they are *Partial identical.*

Each object changes in time. The ordinary needs of a human never require strict identity of objects and situations associated with his (her) life. Therefore, since their birth, all people subconsciously divide all objects and events based on less stringent requirements, than full identity. The brains of the higher animals, such as humans, selectively pick up all

features or properties of objects and events and divide them into two main parts. The properties of one of these parts remain constant or invariant over time, in size, and through several transformations of the object (process). The second part of the features (properties) may vary within wide limits. It is hardly possible to predict in advance how to divide all features (properties) into these two independent parts. The result of this procedure depends on several factors. One of them is strongly tied to the senses of biological species. The other is connected with the environment or, more generally, the context in which the object, or set of actions are perceived. The group of invariant features (properties) is obviously less than the full list of these items. As a result of its incompleteness, the list of invariant properties can be the same for various objects. The difference between these objects is tied to a set of non-variant properties. All objects or processes with the same set of invariant features (properties) in a certain range of requirements can be considered as being similar. In real life, the requirements for matching the properties are less stringent. Therefore, in reality, the groups of objects (goods, materials, processes), which consumers treat as similar can be large. For practical purposes, all these objects and processes are usually treated as similar. All objects or processes which are gathered in such groups are defined as *Sameness Objects*. They are the real replacement of ideal representation of identical objects.

Namely, sameness objects are the targets of everyday human activity. Even a rough estimation of the number of various entities, which are interesting to mankind, is an impossible task. However, there is every reason to believe, that this variety is operated by certain General Laws. This realization did not come immediately. However, there is every reason to believe, that this variety is operated by certain General Laws. They are the body of *General Theory of Diversities.*

Theory of diversities: Brief historical overview

Benedict Spinoza was probably the first, who after the ancient times pronounced the main idea of General Ideas of Diversities [3]. He said:

Nature is always the same, and its virtue and power of acting are everywhere one and the same, that is, the laws and rules of Nature, according to which all things happen, and from one to another, are always and everywhere the same. So, the way of understanding the nature of everything, of whatever kind, must also be the same, namely, through the universal laws and rules of Nature.

Its development in subsequent years was mainly focused on the items of Natural Philosophy. Over time, it became apparent, that the same laws must operate in the field of humanitarian knowledge too. This was clearly reflected in the words of the famous German poet and philosopher Friedrich Schiller. He wrote that human brains require consistency of rules and the nature in opposite to this free variety. Therefore, people should take into account both of these requirements [5].

Subsequently, for almost two centuries scientists and philosophers repeatedly returned to the discussion of this problem. One of the best descriptions of it was given in [6]. Ita authore was the first who suggested the name *Diatropics* for the science, that describes the General Laws of Diversities. This term is still not widely used, because this book was never translated into other languages. A number of investigations in this field was discussed in [6]. The results accumulated over the subsequent twenty years require a new understanding. People need the development of new curricula, which would incorporate the most important recent achievements. An attempt to enumerate problems, which must be known by each educated person, will be discussed further.

Various models of diversity

The Universe is a complex system, and its behaviors may be known only partially. Its perception by humans is possible as a result of modelling. One who defines modelling as a simplified description takes into account only some of the properties. The loss of a number of important properties in the description of Nature is the cost for simplification of studied problems. Depending on a situation a person picks various properties in a simulated system for selection of matters. As a result the plurality of the same matters is possible, for groups together and classified in several different systems. We define each of these systems as *Specific Diversity.* So, the plethora of the same matters may be represented with a set of different diversities. It means that the formation of diversity depends on understanding of human problems. For various situations the set of selected matters and their order in the developed diversity can change. It means that the grouping of matters in diversity depends on the objective properties of the environment and subjective reflections of these properties in the human brains. Depending on the ratio of these

circumstances one can talk about *Native* and *Synthetic* types of diversities [7]. The Various trees like oaks, pins, et cetera are an example of matters in the Native Diversity called Forest. Road signs are an example of Synthetic Diversity. The instance of atoms in the periodic system is an example of diversity which is built on Native Base, but with the strong effect of human understanding. It is a Synthetic System. If desired, it can be considered to be an intermediate type of diversity that may be called *Artificial Diversity*. Trams, buses, cars and other types of municipal and private transportation create another type of intermediate diversity, which is possible to define as *Man-made Diversity.*

Each matter of Nature is a part of or an Object of various diversities. For instance: men's trousers are a part of such diversities as clothing or military uniforms. Items in a store or factory products are a few of them. In each of these different diversities, various properties of one and the same matter appear. The *Completeness* of a matter description includes all possible properties, which humans can know about. This means, that:

A full description of each matter in the Universe is the Diversity of all Diversities in each the matter is a part [7].

For simplification of this terminology Let us call the Diversity of all possible diversities: *Manifold.*

The main properties of diversities

Diversity usually collects matters with various sets of properties. Let us look at the diversity Forest. It includes trees, bushes, streams, bird nests and much more. They are united by the General system of the forest. This system allows for partial ordering. Trees and bushes can be combined into a group by the presence of their trunk. In turn, trees can be split into the groups coniferous and deciduous. Accordingly, any diversity admits partial ordering. In turn, each new grouping of matters itself can be divided into a new diversity on the basis of the other properties combining matters in the new group. This means, each variety is itself a hierarchical system. Objects at each hierarchical level of any system is diversity. Such complex Objects are frequently denoted as *Holons* [8]. According to the holoarchy concept, one says:

The horizontal structure of hierarchical systems (each of its level) appears as several subsystems named holons.

Holons have a dual nature. On the one hand, they represent a holistic alien structure of the whole system. On the other hand, they are almost independent systems of the lower level. It means, they can be divided into smaller items. One can say:

Each holon is a complex aggregate of holons of a lower level range, and at the same time it is an element or holon of a level of a higher range.

To understand the whole system of diversity it is important to pay attention to the nature of the interaction between elements of the system. These interactions exist between the elements of each level of diversity. We call them *Internal Interactions.* In addition, there are interactions between elements of different Objects, or external ones. If the interactions occur at the same level of a hierarchical system, we call them *Horizontal interactions*. The emergence in the system of the substructure is a consequence of the fact, that on the same hierarchical level, the power of internal horizontal interactions is much stronger, than the power from external horizontal interactions. In many practical situations, this permits one to study different Objects at the same diversity level as independent matters.

The General considerations, which have just been given, have been known for a long time. Moreover, it was found, that the most important properties of diversities are possible to be studied independently from the problem being analyzed. One should note that these laws are valid only as they apply to the upper levels of the diversity. The real position of this level is not strictly determined. Determining this level is the *Level of Sameness* [9]. For quite some time it has been empirically known that only the top levels of diversity hierarchy are actual development processes. It was first studied in detail by E. Sedov [10]. He called this empirical observation *The Law of Hierarchical Compensation*. (In many cases this expression is translated into English as *The Law of Requisite Variety*). Sedov's Theorem can be written as:

The growth of variety of the top level of hierarchical diversities ensured by limiting variety at the previous levels; increased variety at the lower levels destroys the top level of the diversity system.

A recent achievement, which must be included in the curriculum, should be considered for the understanding of the phenomena that explains the possibility of limiting the analysis of the properties of diversity only at its upper levels [11]. Initial analyses of the properties of diversities are actually limited by their fixation. Dynamics of processes occurring at different systemic levels of diversity in the first

approximation was not considered. It has become apparent that the nature of vertical interactions between hierarchical levels of diversity is affected by the fact that at these levels the processes occur at different speeds. At lower levels the processes are much faster than at the higher. In other words:

In the vertical interactions, average results of horizontal interactions are involved.

This statement proves the theorem by Sedov as well as similar conclusions made by other authors. The second important conclusion that one should understand is the explanation for why many General considerations about laws in complex hierarchical systems are so difficult to use for explaining social and cultural phenomena. It turns out that the time intervals used for analysis of such historical events are too small to reveal consistent trends in random processes which are always present in both vertical and horizontal interactions [11]. For instance: one knows that to find and investigate the objective laws of history it is necessary to average all data about real events over large periods of time. This period is known as *Long Term* [12].

Which main properties of diversities are necessary for inclusion in the curriculum at the tertiary level

As matters are included in the diversity, so diversity in any system is constantly evolving. The first stage in learning the theory of diversity is an explanation of conditions, which permit humans to divide the study of problems of static description of General properties of diversities and the laws of their development. The trainee must understand that this is one of the most difficult problems of learning the behaviors of Nature. This problem does not have a universal solution. An optimal instructional strategy must include the study of this problem in several basic subjects across a given period of education.

The next stage is the description of two problems. The first one is the dynamics of the origin, development, and extinction of diversities. The instructor must explain that these laws are most easily seen on technical objects or artificially created varieties of objects [7]. It is clear that for each area of future professional interests of trainees, each instructor must have various specific examples. The second main law which has to be taught from the first steps in learning the evolution of diversities is the law that:

Development of each new diversity comes from any single entity.

It may be protobacterias, primitive tools, primary investigations, et cetera. The next important basic statement is that:

Not only animated matter yet also in techniques, technology and abstract ideas the dynamic development of diversity depict the struggle between specific entities: types, technical objects, natural structures, various transformations, etc.

The next stage in the study of diversities should be familiar with the most important of their static properties. Here, the most important point to explain is the law that:

The distribution of objects in the diversity about their specific properties is uneven. A large part of objects applies to a limited number of subgroups. The other subgroups include only a few entities. As a result one can say that: All objects in each diversity are distributed unevenly.

It is described by curves of distribution. At the same time:

All possible combinations of properties are always implemented in every variety.

A very important law to be thoroughly explained to students, that it is necessary to consider the statement that:

The object of the diversity at the structural level is always built from the full set of elements of a diversity subsystem at the next level.

The last stage of understanding the problem of diversities is the analysis of specific diversities, connected with future professional interests of students. Our experience says that analysis of content specific diversities creates students' understanding in close connection between the General theory of diversities and the Theory and practice of classification systems. All of the proposed system descriptions in the end come down to facet (tabular) descriptions. The mentioned above is the objective laws of human reflection properties of diversities.

It is also necessary to explain to students that the complexity of any diversity, or its Objects is directly connected to their sustainability. The main rule here is:

The more complex is the structure of any diversity, the less it is stable [7].

In addition, it is useful to underline that the main resume of humankind knowledge says:

The increasing complexity of diversity (system object) is associated with an increase in consumption of feed resources from the environment.

The trainees must firmly grasp that the observed deviations from this rule are rare and extremely significant. Each educated person must understand also that:

The complexity of diversity in terms of enhancing their stability has some restrictions.

Therefore, one needs to roughly estimate the optimal complexity of diversity. Yet it is also necessary to know that the evolution and technical progress are in the direction of increasing numbers and increasing complexity of the manifolds and their components. This complication occurs in leaps and bounds in various fields of life and the speed is limited to domestic laws, some of which are not yet known.

Our environment is very complex. It consists of many various diversities with different nature and structure. All of them are in constant interaction with each other. There are two possible main ways of supporting these interactions. One of them is hierarchical. The second one has so-called *Net Structure*. In reality, it is more often that one can meet situations with combinations of both types of structures of interaction. The sudden change in the external environment is produced in this competition network system of interactions and usually has some advantages over the hierarchical one. Diversification here is created through the development of the variety of intersystem relations. Under normal conditions, the advantages have the hierarchical system.

The sharp complication of the structure of diversity, organized by hierarchical type, leads to the emergence of a large number of sublevels. The consumption of deep sublevels of system diversity resources is external to the sublevel, and at the same time is internal in relation to the diversity in General. This depletes the resources of diversity as relates to unity, and obviously, slows down internal resource and, in particular, information exchanges. It is highly likely that the rate of resource exchanges may generally serve as a basis for actual and theoretical allocation (education) of the new variety.

In Nature, various diversities are frequently in close contact with each other. The borders between two or more diversities form a transitional zone. Sometimes this zone is called with a biological term: *Ecotone.* In this area of knowledge ecotone describes a spread border between two diversities, which contain unique species and plants. They usually exist only in this zone. Frequently a seed is located in them, from which a new diversity is born. New important fields of application of the theory of diversities should be considered Humanities. Here, this theory explains the necessity of the simultaneous existence of different cultures. A number of historical patterns can also be understood, when studying the laws of evolution of diversities.

Approvals, which are briefly enumerated in this section, are the principal base for building modern instructional strategies at a tertiary level.

Conclusions

1. Theory of diversities is one of the basic fields in Universal Curriculum Core at a tertiary level.
2. The main stages of teaching the Theory of Diversities are described.
3. The learning of professional problems, tied to the theory of diversities, is the starting point after learning some general laws. It is connected to a detailed study of specific entities, which are gathered in a diversity.
4. All faculties should be familiar with the General principles of evolution of diversities. Only in this case it is possible to build optimal educational strategies.
5. Study of the possibilities of application of the theory of diversities in the Humanities knowledge is a promising direction in teaching several social science disciplines.

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PHENOMENOLOGICAL APPROACH TO SOLUTION OF BEAL'S CONJECTURE AND FERMAT'S LAST THEOREM

Ivliev Y.A.

International Informatization Academy, Moscow, e-mail: yuri.ivliev@gmail.com

The given article suggests a mathematical solution of the Beal Conjecture (generalized Fermat's Last Theorem) obtained by arithmetic geometry methods known yet to ancient mathematician and developed by the author. Application of these methods became possible only after reformulation of generalized Fermat's Theorem in terms of phenomenological approach implying by Fermat himself during registration of his theorem. These methods include constructing powers of whole numbers by means of proportions, making up partitions from them, their scaling-up and scaling-down in order to get equal similar partitions. As a result of such transformations, the Beal equation comes to the Fermat equation, which has no solution in positive whole numbers that is proved by the same methods plus Fermat's method of infinite descent. The given research is fulfilled in the system of right-angled numbers introduced by the author and leading to the mathematical discovery of Beal's Conjecture solution.

Keywords: Beal's Conjecture, Fermat's Last Theorem, arithmetic geometry, partitions, ancient mathematics

AMS Subject Classification: 11 Number theory, 11G Arithmetic algebraic geometry (11G99), 11P Additive number theory; partitions (11P99).

Introduction. Beal's Conjecture as generalized Fermat's Last Theorem (formulation of the problem)

Beal's Conjecture [1] deals with arbitrary positive whole powers of natural numbers except the second combined in one equation similar to the well-known equation of Fermat's Last Theorem. The Beal proposition can be solved by the ancient Greek arithmetic geometry methods applied successfully as well to the Fermat problem [2]. Among all well-known mathematics conjectures Beal's Conjecture is occupying a peculiar place being a generalization of Fermat's Last Theorem [1]. However the generalization in [1] concerns only the formal record of this conjecture and does not summarize the methods of proving Fermat's Last Theorem. On the contrary, the Beal conjecture comes to the Fermat problem considered as an arithmetic geometry problem with elements of combinatorics and has easy simple solution obtained by additive number theory methods apparently available to ancient mathematicians and Fermat too [2]. The suggested proof of Beal's Conjecture can be related to the part of number theory defined as arithmetic algebraic geometry in spite of that it can be acquired by means of elementary arithmetic operations [2].

Pierre de Fermat formulated his famous proposition on the margin of Diophantus' "Arithmetic" (near the task 8 of the book II). The eighth problem of the second book asks to separate a square into two squares in whole numbers. It was known long ago that this problem has an infinite set of solutions. But Fermat generalized the task in case of any whole power above the second and pointed out at impossibility of such partition in whole numbers claiming here that he found a "miraculous" proof of this proposition. In order to reconstruct Fermat's proof it is necessary to understand what Fermat meant by his recording on the margins of Diophantus' book. So at the very beginning it is a question of fundamental approach to this problem solving by Fermat. Psychologically it is clear that it could be a phenomenological approach when each power of natural numbers is considered as an amount of indivisible multidimensional unit cubes in multidimensional arithmetic space. Thus the task was analogous to the ancient receipt of alchemy: first resolve into elementary units and then put them together in a required manner. "Pure" mathematical unit can be chosen as such elementary unit.

How could Fermat solve this unique problem straight off and without a shadow of doubt ? The sole reason for it is that he saw the mental picture of his proof. Such a picture emerged in his consciousness during his insight allowing him to investigate instantly all necessary details of solution [2]. Visual image of the problem must have had a geometrical form, which apparently could not take its place on narrow margins. This geometric pattern serves as general illustration for Euclid's theorem about proportional means, from which formulation of Pythagorean theorem and Fermat's proposition (called Fermat's Last Theorem later on) could be easily derived. Figure taken from [2] shows stylized design of Euclid's geometrical theorem on the fractal surface of similar right angle triangles at an instantaneous position of the small diameter of Figure shifting from state Φ_1 to state Φ_2.

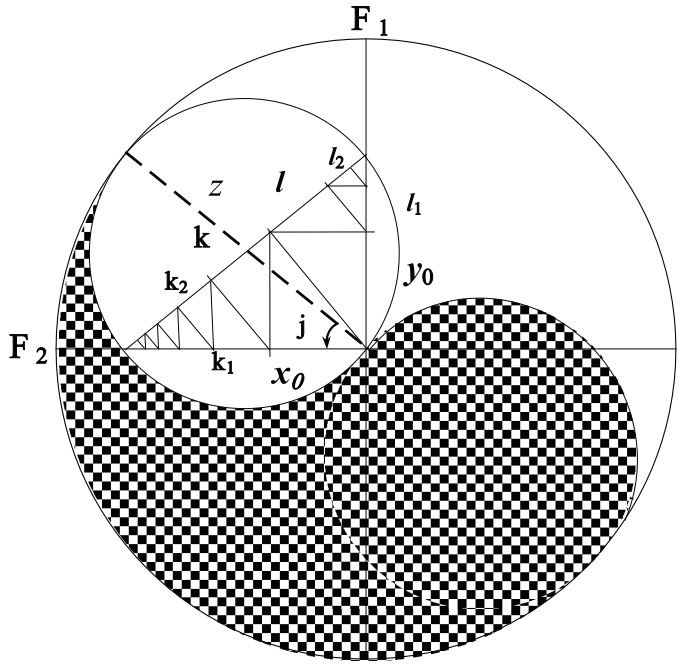

Fig. The designations are explained in the text

Let us proceed following Fermat's mental investigation of Pythagorean theorem and its generalizations in the case of any *n*-th degree on splitting higher whole powers into two powers of the same degree. Ancient Greek mathematicians could solve some algebraic equations with only arithmetic methods on the basis of Euclidean geometry, so that they might be called arithmetic geometry methods and included into the range of modern arithmetic algebraic geometry. Of course, Fermat knew about these ancient methods and could develop them using his visual observation of such properties of geometrical figures that became origins for future algebraic notions. But Fermat did not produce new terminology and formulated his research results in pure arithmetic manner. Moreover, his perception of *n*-th degrees of whole powers was related to Cartesian product of whole numbers from *n*-dimensional arithmetic space and then each *n*-th power could be represented as a collection of *n*-dimensional unit cubes transferred from the state Φ_1 to the state Φ_2 one by one on the diagram of Figure. This procedure serves as well for finding Pythagorean triples by the method of sorting square units one by one in Pythagorean equation. This method can be applied also to the equation of generalized Fermat's Last Theorem in order to show that splitting of *n*-th power of whole numbers into two other powers with $n > 2$ is impossible. However phenomenological approach described here was not perceived by reviewers of pure mathematical journals and proofs of Beal's Conjecture and Fermat's Last Theorem on the indicated phenomenological base were not considered. It was also conditioned by previous acknowledgement of doubtful proofs of Fermat's Last Theorem in pure mathematics [3; 4].

Solution of Beal's Conjecture and Fermat's Last Theorem

The Beal Conjecture states [1]:

The equation $A^x + B^y = C^z$ *has no solution in positive integers* A, B, C, x, y, *and* z *with* x, y, *and* z *at least* 3 *and* A,B, *and* C *coprime.*

Or, restated [1]:

Let A, B, C, x, y, *and* z *be positive integers with* x, y, $z > 2$. *If* $A^x + B^y = C^z$, *then* A, B, *and* C *have a common factor.*

Let us rewrite hypothetical Beal's Conjecture equality in the following way:

$$x^n + y^n = z^n, \qquad (1)$$

with positive integers x, y, z having a common factor and exponent n taking simultaneously the next spectrum of values: $n = (p, q, m)$, where integers p, q, m at least 3 and n has

one independent value for each term. So we assume at the beginning that equality (1) exists and partitions of the type (1) can be obtained. This method of proof is related to plausible reasoning and called the rule of contraries. Then one can explore some arbitrary solutions of equation (1) in whole numbers.

Consider equality (1) as a partition of whole number z^n into two whole parts x^n and y^n. It resembles Pythagorean equation in real numbers, if we could bring powers in (1) to the degree 2 with whole parts in the similar partition: $z^2 = x^n/\ z^{n-2} + y^n/\ z^{n-2}$. For example, the sacred Egyptian triangle corresponds to the equality: $25 = 16 + 9$, that comes of the application of Euclid's geometrical theorem (see Figure): $z = k + l$, $z^2 = z\,k + z\,l = x_o^2 + y_o^2$, $5 = 16/5 + 9/5$, $5^2 = 4^2 + 3^2$. To produce such scaling, let us introduce the notion of right-angled numbers (these numbers are different from so called right angle triangle numbers representing Pythagorean triples).

Definition. Right-angled number is such a non-negative real number, the square of which is a whole non-negative number.

The set of right-angled numbers $\mathbf{P} = \{0, 1, \sqrt{2}, \sqrt{3}, 2, \sqrt{5}, \ldots\}$ is countable. The system of right-angled numbers $P = \langle \mathbf{P}, +, \cdot, 0, 1 \rangle$ is defined by operations of addition and multiplication and two singled out elements (zero and unit). The system P is non-closed in relation to addition. Notice that the set of non-negative whole numbers is a subset of the set of right-angled numbers. Then consider (1) on the 2-dimensional lattice of right-angled numbers with coordinates x_o, y_o, and that, which we call the norms of a right-angled number z assigned to different pairs (x_o, y_o) and differing from each other by the value of its summands: $z^2 = x_o^2 + y_o^2$ (for Egyptian triangle there are 25 such norms: $25 = 1 + 24 = 2 + 23 = \ldots$). The norm of non-zero right-angled numbers is always whole and cannot be less than 1. Whole numbers x_o^2 and y_o^2 run through values from 1 to z^2 and from z^2 to 1 one by one. So number z has z^2 different partitions as its norms. Similarly any whole power of whole numbers could be expanded to the sum of whole numbers with the aid of right-angled numbers, if we choose the needed common factor in (1). It corresponds to the initial formulation of the problem upon condition that powers in (1) consist of indivisible units. All other possibilities to represent degrees of whole powers using other number systems (for example, rational number systems) are excluded as irrelevant to the formulated problem.

For the purpose of reducing (1) to the view of Pythagorean equation in the system of right-angled numbers, one can rewrite (1) as an equality for some coprime x', y', z', and common whole factor d: $(x'd)^p + (y'd)^q = (z'd)^m$ and fulfil scaling-down:

$$(z'd)^2 = (x'd)^p / (z'd)^{m-2} + (y'd)^q / (z'd)^{m-2} =$$
$$= (x')^p\, d^{\,p-m+2} / (z')^{m-2} +$$
$$+ (y')^q\, d^{\,q-m+2} / (z')^{m-2} = x_o^2 + y_o^2,$$

where x_o^2 and y_o^2 with appropriate d are squares of some right-angled numbers x_o and y_o. If exponents p and q equal m, then d^2 can be $(z')^{2m-4}$. In other words, we seek such d that satisfy the above stated condition to get whole parts in the sum of this equality. It assumes the following view of (1) after fulfilling scaling-up:

$$z^m = x^p + y^q = z^{m-2}\,(x_o^2 + y_o^2). \qquad (2)$$

Let us apply now the ancient method of making powers using Euclid's geometrical theorem [2] and produce two chains of proportions connected with each other with some equality presenting integer z as a sum of two whole numbers:

$$z/x_o = x_o/k = k/k_1 = \ldots = k_{m-3}/k_{m-2}, \qquad (3)$$
$$z/y_o = y_o/l = l/l_1 = \ldots = l_{m-3}/l_{m-2},$$

where z, x_o, y_o are right-angled numbers from (2), m natural index at least 3,and $z = k + l$; k and l are some whole parts of z taken from the method of scaling-down (see below).

From proportions (3) one can obtain the next formulae:

$$x_o^2 = kz = (k_1 z / x_o)z,$$
$$x_o^3 = k_1 z^2 = (k_2 z / x_o)z^2, \ldots,$$
$$x_o^m = k_{m-2} z^{m-1}, \qquad (4)$$
$$y_o^2 = lz = (l_1 z / y_o)z,$$
$$y_o^3 = l_1 z^2 = (l_2 z / y_o)z^2, \ldots,$$
$$y_o^m = l_{m-2}\, z^{m-1},$$

where integers k and l are found from the basic equality (1):

$$z = (z'd) = (x'd)^p / (z'd)^{m-1} +$$
$$+ (y'd)^q / (z'd)^{m-1} = (x')^p\, d^{\,p-m+1} / (z')^{m-1} +$$
$$+ (y')^q\, d^{\,q-m+1} / (z')^{m-1} = k + l.$$

If exponents p and q more or equal m, then numbers k and l are whole with $d = (z')^{m-1}$ as a minimum (d can be some whole number divisible by this minimum).

From (2) and (4) we get equal similar partitions of z^n into two whole parts:

$$z^m = x^p + y^q = z^{m-2}(x_o^2 + y_o^2) = x^m + y^m, \quad (5)$$

hence $x^p = (x^{p/m})^m = x^m$, $y^q = (y^{q/m})^m = y^m$ with whole x, y by construction (for simplicity we do not change here the designations for x, y although exponents p and q are tuple to m). Square roots of x^m, y^m are mean proportionals between x_o^2 and z^{m-2}, y_o^2 and z^{m-2} describing a bigger right angle triangle defined by the hidden Pythagorean equality $z^m = x^m + y^m$ found from the relations: $x^m = k\, z^{m-1}$, $y^m = l\, z^{m-1}$. This implicit triangle is similar to that with sides z, x_o, y_o represented by equality $z^2 = x_o^2 + y_o^2$.

So (1) comes to the Fermat equality (Pythagorean equality in right-angled numbers) that is equivalent to hypothetical phenomenological equality (1);

$$x^m + y^m = z^m,\ m \geq 3, \quad (6)$$

with whole $x = x'd$, $y = y'd$, $z = z'd$, and some whole factor d that can be expanded into the product of prime factors. One can prove Fermat's Last Theorem now with the same methods as above in order to obtain solution of the Beal Conjecture in full and one measure.

Let us write Fermat's Last Theorem in its usual form:

$$z^n = x^n + y^n,\ n > 2. \quad (7)$$

Suppose that one solution at least was found. Then we shall try to construct such a solution and make certain of its impossibility. We shall work in the system of right-angled numbers (see above *Definition*).

Consider (7) on the 2-dimensional lattice of right-angled numbers with right-angled coordinates x_0 , y_0 and corresponding norm $z^2 = x_0^2 + y_0^2$ differing by its square fragments relating to definite right-angled coordinates and being a partition of non-zero number z^2 into two summands represented by non-negative whole numbers. The minimal (non-zero) norm (standard) of right-angled numbers equals 1.

To construct powers of whole numbers presented in (7), let us produce two chains of continued proportions connected with each other by the norm $z^2 = x_0^2 + y_0$:

$$z/x_0 = x_0/k = k/k_1 = \ldots = k_{n-3}/k_{n-2},$$

$$z/y_0 = y_0/l = l/l_1 = \ldots = l_{n-3}/l_{n-2}, \quad (8)$$

where natural indices of the last terms of each chain in (8) are obtained from $n > 2$. Continued proportions (8) yield the following formulae:

$$kz = x_0^2,\ k_1 z = x_0 k,\ k_2 z = x_0 k_1,\ \ldots,\ k_{n-2} z = x_0 k_{n-3},$$

$$lz = y_0^2,\ l_1 z = y_0 l,\ l_2 z = y_0 l_1,\ \ldots,\ l_{n-2} z = y_0 l_{n-3}, \quad (9)$$

$$x_0^2 = kz = (k_1 z / x_0)z,\ x_0^3 = k_1 z^2 = (k_2 z / x_0)z^2,\ \ldots,\ x_0^n = k_{n-2} z^{n-1},$$

$$y_0^2 = lz = (l_1 z / y_0)z,\ y_0^3 = l_1 z^2 = (l_2 z / y_0)z^2,\ \ldots,\ y_0^n = l_{n-2} z^{n-1}. \quad (10)$$

It is necessary now to fix the norm for the partition of z^n into two like powers in (7). As in the case of Beal's Conjecture, let us assume that z, x, y in presupposed equality (7) have a common factor d, i. e., $z = (z'd)$, $x = (x'd)$, $y = (y'd)$, where z', x'. y' coprime. Thereupon divide equality (7) by z^{n-1} and get: $z = (z'd) = (x'd)^n / (z'd)^{n-1} + (y'd)^n / (z'd)^{n-1} = k + l$, where k and l integers with $d = (z')^{n-1}$ as a minimum. From this and (9)–(10) it follows that $z^2 = x_0^2 + y_0^2$ and $z^n = z^{n-2}\,(x_0^2 + y_0^2)$ is a scaled-up modification of the norm $z^2 = x_0^2 + y_0^2$.

Further, one can obtain a singular partition of z^n into three terms from (10) for the given norm when $n > 2$:

$$z^n = x_0^n + y_0^n + \lambda_n, \quad (11)$$

where $\lambda_n = z^{n-1}\,[(k - k_{n-2}) + (l - l_{n-2})]$ is a remainder after subtracting x_0^n and y_0^n out of z^n such that $\lambda_n > 0$ when $n > 2$ and $x_0 y_0 \neq 0$, $\lambda_n = 0$ when $n = 2$ and $x_0 y_0 \neq 0$, $x_0, y_0, \in [0, z]$, $z \in (0, \infty)$.

Thus there exists one-to-one correspondence between each pair of numbers (x_0, y_0) with norm $z^2 = x_0^2 + y_0^2$ from 2-dimensional arithmetic space and each corresponding partition of any whole power with $n > 2$ of integer z from n-dimensional arithmetic space into the sum of the same powers of numbers x_0, y_0 and remainder λ_n from (11). Isomorphism (one-to-one correspondence) between the set of points of 2-dimensional Euclidean space with position vector length z and coordinates x_0, y_0 , the set of partitions of z^2 into squares, and the sets of partitions (11) for any whole $n > 2$ can be written as follows:

$$\{z \Rightarrow (xo, yo)\} \leftrightarrow \{z^2 = x_0^2 + y_0^2\} \leftrightarrow \leftrightarrow \{z^n = x_0^n + y_0^n + \lambda_n\},$$

where sets of partitions are generated by the next power similarities:

$$z \leftrightarrow z^2 \leftrightarrow z^n,\ x_0 \leftrightarrow x_0^2 \leftrightarrow x_0^n,\ y_0 \leftrightarrow y_0^2 \leftrightarrow y_0^n.$$

Partitions (11) can be reduced to the norm, from which they were obtained:

$$z^n = x_0^n + y_0^n + \lambda_n = z^{n-2}\,(x_0^2 + y_0^2) = = x^n + y^n. \quad (12)$$

Formula (12) represents by itself a combinatorial equality of two partitions in three

and two terms because of the one-to-one correspondence between pairs (x_0, y_0) and presupposed partition (7). It means that partition (11) coincides with partition (7) if the latter exists. In the case of right-angled numbers this equality is realized only if x_0, y_0 integers. Algorithm of such correspondence is given in the next formula (13). Thus scaling invariance of the norm $z^2 = (x_0^2 + y_0^2)$ leads to the following equalities of different fragments of partitions (12):

$$x_0^n + y_0^n = (x^n \text{ or } y^n), \qquad (13)$$

and correspondingly $\lambda_n = (y^n \text{ or } x^n)$. It can be noticed that $x_0^n \neq z^{n-2} \cdot y_0^2 = y^n$ and $y_0^n \neq z^{n-2} \cdot x_0^2 = x^n$ because of the lack of coincidence of decompositions in factorization of numbers x_0^n and y^n, y_0^n and x^n. Obviously, $x_0^n \neq z^{n-2} \cdot x_0^2$ and $y_0^n \neq z^{n-2} \cdot y_0^2$. One can show also that x_0 and y_0 cannot be irrational in (13) on account of integer partition of z^n into x^n and y^n when $n > 2$ [2].

Let us come back to the assumption at the beginning of the proof that integer solution (7) exists. This assumption is substantiated only if there is a concrete solution (13) in whole numbers. In order to check the validity of (13) it is necessary to construct it with the same reasoning as before, since equations (7) and (13) are identical by their properties. This procedure can be continued to infinity in the direction of decreasing whole numbers under condition that sequence of different chained equalities never stops and numbers x_0^2 and y_0^2 in (12) will be always whole. If it is not so, i.e., x_0^2 and y_0^2 in chained equalities (13) turn out to be fractions, then this means that solution (7) does not exist in the system of right-angled numbers**.** Actually, since all partitions of the type (12) are built from the very beginning exclusively on the set of right-angled numbers' squares being in fact whole items of finite series of partitions, then non-whole x_0^2 and y_0^2 show pointlessness of such procedure, i.e., the absence of integer solution (7) or zero solution. On the other hand, infinite sequence of chained equalities (13) leads to infinite decreasing of positive whole numbers that is impossible and therefore assuming that there exists an integer solution of (7) when $n > 2$ is not true. Thus the theorem is proved both for all even and for all odd degrees of whole numbers and for any finite whole x, y, z, d.

Conclusion

Beal's Conjecture solution contains in itself the description of a new hypothetical mathematical object with simple properties conditioned only by its intrinsic structure. One can see this structure formed from similar right angle triangles obtained with the aid of Pythagorean triples z, x_0, y_0 characterizing hypothetical partition (7) on the diagram of Figure. This hypothetical mathematical object represents by itself a closed cycle of identical transformations of one and the same partition $z^n = x^n + y^n$:

$$z^n = x^n + y \leftarrow z^n = \left(x_0^n + y_0^n\right) + \lambda_n$$
$$\downarrow \qquad\qquad \uparrow$$
$$z^n = z^{n-2}\left(x_0^2 + y_0^2\right) \rightarrow z^n = x_0^n + y_0^n + \lambda_n$$

Equality of the above partitions is substantiated only by suggestion that whole power $n > 2$ can be divided into two whole parts that leads automatically to similarity and equality in itself of one and the same partition given in the form of two or three terms.

However generalized Fermat's Last Theorem states that it is impossible to construct partition (1) or (7) into other n-th powers of whole numbers when $n > 2$. Applying the rule of contraries we claim that if such partitions exist then partitions (13) exist as well. Construction of (13) leads in total to a zero result and therefore generalized Fermat's Last Theorem can be regarded as a mathematical discovery running ahead of its proof.

Beal's Conjecture can be also considered at the level of metamathematics when it is necessary to choose an adequate number system for solution of this problem. In the given case such an adequate number system was the system of right-angled numbers. This system have many interesting applications in natural sciences [2]. In particular, it participates in forming a surface fractal consisted of decreasing right angle triangles and revealed in quantum physics applications.

In conclusion we suppose that contemporary theoretical science seemed to be exhausted in its description of real world and new alternative bases of physics, chemistry, and other disciplines should be searched. These bases can be found by studying the diagram of Figure representing kinematics and dynamics of any interaction processes in nature. One can begin for example at that all school trigonometry can be considered and described in visual language of potential geometrical constructions of Figure. Moreover, outstanding progress is expected in quantum informatics using quantum (phenomenological, in our terminology) approach in analogue computation of 3-dimensional space states described

by a 4-dimensional space sphere according to the Poincare Conjecture and conditionally represented on Figure [2]. Thus any objective reality can be adequately described with the aid of right mathematical perception leading to broadening of human consciousness and therefore discovering new possibilities in new fields of knowledge. It means that such quantum approach will allow to equate human perception with real physical and other natural processes.

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ON MULTICRITERIA MODELING PROBLEM

Matusov J.

Mechanical Engineering Research Institute, Russian Academy of Sciences, Moscow, e-mail: matusoff.l@yandex.ru

The engineering optimization and identification problems are essentially multicriteria. The multicriteria method of identification of a mathematical models are considered in our work.

The Formulation of Multicriteria Optimization Problems

Let us consider an object whose operation is described by a mathematical model (system of equations) or whose performance criteria may be directly calculated. We assume that the system depends on r design variables $\alpha_1,...,\alpha_r$ representing a point $\alpha = (\alpha_1,...,\alpha_r)$ of an r-dimensional space. In the general case one has to take into account design variable, functional, and criteria constraints [1] .There exist particular performance criteria, such as productivity, materials consumption, and efficiency. It is desired that, with other things being equal, these criteria, denoted by $\Phi_\nu(\alpha)$, $\nu = 1,...,k$ would have the extremal values. For simplicity, we assume that $\Phi_\nu(\alpha)$, are to be minimized. In order to avoid situations in which the expert regards the values of some criteria as unacceptable, we introduce criteria constraints $\Phi_\nu(\alpha) \le \Phi_\nu^{**}$, $\nu = 1,...,k$, where Φ_ν^{**} is the worst value of criterion to which the expert may agree. All these constraints) define the feasible solution set D [1].

Definition. A point $\alpha^0 \in D$, is called the Pareto optimal point if there exists no point $\alpha \in D$ such that $\Phi_\nu(\alpha) \le \Phi_\nu(\alpha^0)$ for all $\nu = 1,...,k$ and $\Phi_{\nu_0}(\alpha) < \Phi_{\nu_0}(\alpha^0)$ for at least one $\nu_0 \in \{1,\dots,k\}$.

A set $P \subset D$ is called a Pareto optimal set if it consists of Pareto optimal points. When solving the problem, one has to determine design variable vector $\alpha^0 \in P$, which is the most preferable among the vectors belonging to set P.

The Pareto optimal set plays an important role in vector optimization problems because it can be analyzed more easily than the feasible solution set and because the optimal vector always belongs to the Pareto set, irrespective of the system of preferences used by the expert for comparing vectors belonging to the feasible solution set. Solving the specified problems was made possible owing to the PSI method [1].

Multicriteria identification (modeling). Adequacy of mathematical models

In the most common usage, the term "identification" means construction of the mathematical model of a system and determination of the parameters α_j (design variables) of the model by using the information about the system response to known external disturbances. Very often, when solving identification problems, the researcher has no information about the limits α_j^* and α_j^{**} for many of the variables. As a rule these applied identification problems have been treated as single-criterion problems. In the majority of conventional problems, the system is tacitly assumed to be in full agreement with its mathematical model. However, for complex engineering systems we generally cannot assert a sufficient correspondence between the model and the object. This does not permit us to use a single criterion to evaluate the adequacy. In multicriteria identification problems there is no necessity of artificially introducing a single criterion to the detriment of the physical essence of the problem. When constructing a mathematical model one first defines the class and structure of the model operator, that is, the law according to which disturbances (input variables) are transformed into the system response (output processes). This is called structural identification. For mechanical systems structural identification means determining the type and number of equations constituting the mathematical model of the system. Parametric identification is reduced to finding numerical values of the equation coefficients, based on the realization of the input and output processes. In doing so, frequency responses, transfer functions, and unit step functions are often used. A number of problems require preliminary experimental determination of the basic characteristics of a mechanical system (e.g., the frequencies, shapes, and decrements of natural oscillations). When solving optimization problems, we have used the concept of performance criterion. In identification problems we will deal with particular adequacy (proximity) criteria. By adequacy (proximity) criteria we mean the discrepancies between the experimental and computed data, the latter being determined on the basis of the mathematical model. In all basic units of the structure under study we experimentally measure the values of the characteristic quantities of interest (e.g., displacements, velocities, accelerations, etc.). At the same time we calculate the corresponding quantities by using the mathematical model. As a result, particular adequacy (proximity) criteria are formed as functions of the difference between the experimental and computed data. Thus we arrive at a multicriteria problem. The multicriteria consideration makes it possible to extend the application area of the identification theory substantially.

Parameter Space Investigation Method in Problems of Multicriteria Identification

We denote by $\Phi_\nu^c(\alpha)$, $\nu = \overline{1,k}$ the indices (criteria) resulting from the analysis of the mathematical model that describes a physical system,

where $\alpha = (\alpha_1,..., \alpha_r)$ is the vector of the parameters of the model. Let $\Phi_\nu^{\exp}$ be the experimental value of the ν th criterion measured directly on the prototype. Suppose there exists a mathematical model or a hierarchical set of models describing the system behaviour. Let $\Phi = \left(\left\|\Phi_1^c - \Phi_1^{\exp}\right\|,\ldots, \left\|\Phi_k^c - \Phi_k^{\exp}\right\|\right)$, where $\|\cdot\|$ is a particular adequacy (closeness, proximity) criterion. This criterion, as has already been mentioned, is a function of the difference (error) $\Phi_\nu^c - \Phi_\nu^{\exp}$. Very often it is given by $\left(\Phi_\nu^c - \Phi_\nu^{\exp}\right)^2$ or $\left|\Phi_\nu^c - \Phi_\nu^{\exp}\right|$. If the experimental values $\Phi_\nu^{\exp}$, $\nu = \overline{1,k}$ are measured with considerable error, then the quantity $\Phi_\nu^{\exp}$ can be treated as a random variable. If this random variable is normally distributed, the corresponding adequacy criterion is expressed by $M\left\{\left\|\Phi_\nu^c - \Phi_\nu^{\exp}\right\|\right\}$, where $M\{\|\cdot\|\}$ denotes the mathematical expectation of the random variable $\|\cdot\|$. For other distribution functions, more complicated methods of estimation are used, for example, the maximum likelihood method. We formulate the following problem by comparing the experimental and calculation data, determining to what extent the model corresponds to the physical system, and finding the variables of the model. In other words, it is necessary to find the vectors α^i satisfying design variable, functional, and criteria constraints design variable, functional, and criteria constraints and, in addition, the inequalities $\left\|\Phi_\nu^c\left(\alpha^i\right) - \Phi_\nu^{\exp}\right\| \le \Phi_\nu^{**}$.

All these conditions defines the feasible solution set D_α. Here, Φ_ν^{**} are criteria constraints that are determined in the dialogue between the researcher and a computer. To a considerable extent, these constraints depend on the accuracy of the experiment and the physical sense of the criteria.

The Search for the Identified Solutions

The formulation and solution of the identification problem are based on the parameter space investigation method. In accordance with the algorithm given above, we specify the values Φ_ν^{**} and find vectors meeting above meanshioned conditions. The vectors α_{id}^i belonging to the feasible solution set D_α will be called adequate vectors. The vectors α_{id}^i that belong to the set of adequate vectors and have been chosen by using a special decision making rule will be called identified vectors.

The role of the decision making rule is often played by nonformal analysis of the set of adequate vectors. If this analysis separates several equally acceptable vectors α_{id}^i, the solution of the identification problem is nonunique.

The identified vectors α_{id}^i form the identification domain $D_{id} = \bigcup_i \alpha_{id}^i$. Sometimes, by carrying out additional physical experiments, revising constraints Φ_ν^{**}, etc., one can reduce the domain D_{id} and even achieve the result that this domain contains only one vector. Unfortunately, this is far from usual. Nonunique restoration of variables is a recompense for the discrepancy between the physical object and its mathematical model, incompleteness of physical experiments, etc. If a mathematical model is sufficiently good (i.e., it correctly describes the behaviour of the physical system), then multicriteria parametric identification leads to a nonempty set D_α. The most important factors that can lead to an empty D_α are imperfection of the mathematical model and lack of information about the domain in which the desired solutions should be searched for. The search for the set D_α is very important, even in the case where the results are not promising. It enables the researcher to judge the mathematical model objectively (not only intuitively), to analyze its advantages and drawbacks on the basis of all proximity criteria, and to correct the problem formulation. Thus, multicriteria identification includes the determination and nonformal analysis of the feasible solution set D_α with regard to all basic proximity criteria, as well as finding identified solutions α_{id}^i belonging to this set. Multicriteria identification is often the only way to evaluate the quality of the mathematical model and, hence, to optimize this model. The algorithm is successfully used in practice. Below we discuss some important problems that are solved by using this algorithm.

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The work is submitted to the International Scientific Conference “Computer modeling in science and technology”, UAE (Dubai), March 4–10, 2017, came to the editorial office on 25.02.2017.

INVESTIGATION OF THE I-CONCEPT OF USERS OF SOCIAL NETWORKS

Fedoseeva T.E., Ivanova I.A., Emelyanova A.M., Sineva E.D.

Nizhny Novgorod State Pedagogical University n.a. Kozma Minin, Nizhny Novgorod, e-mail: larry7@mail.ru

The article is devoted to the analysis of the peculiarities of the personality of users of social networks. The concept of "self-presentation" in its relationship with the "I"-concept of users is considered. The author holds the idea that there are differences in the features of the self-presentation of men and women on a personal page in a social network, due to the peculiarities of their "I"-concept. The article is a presentation of the results of an empirical study based on the analysis of visualized images in self-presentation on the personal page of users of social networks as a behavioral component of the self-concept. The description of gender differences in the content analysis results of the users' pages is described: the self-presentation of men is directed to a greater extent on such spheres as achievement of goals, career ladder, success; Self-presentation of women is aimed at dating, relationships, family, drawing attention to the exterior. It is proved that the features of the self-presentation of the user's personality in the social network are determined by the peculiarities of his "I-conception". The relevance of the article is connected with the expansion of the scope of the use of social networks and the insufficient degree of study of the problem of the personal characteristics of their users.

Keywords: virtual personality, self-presentation of users of social networks, "I"-conception

The phenomenon of social networks is very young and only starts to attract the scientists' attention. Nevertheless, in scientific research one can more often meet the term "virtual personality" and "virtual identity". Thus, E.A. Gorny [2] has singled out functions and types of virtual personality to which he refers creating a self-image "for others", modeling, social engineering, mystification and realization of the need for mispresentation of selfhood "for others" – mummery. Different aspects of the problem of network identity have been studied abroad by V. Frindte, T. Keler [4]. In our country this problem is being developed by E.P. Belinskaya, A.E. Zhichkina, N.V. Chudova, I.A. Medvedeva, T.A. Artishevskaya, I.S. Shevchenko and others. Works of G. Asmolov and M. Sokolov are devoted to the study of the personal characteristics of the blogosphere participants.

Of special interest to us is similarity and discrepancy between the "virtual identity" and the real personality of the users.

The social networks have become the main means of self-presentation of many people nowadays. The concept of self-presentation, defined by Zh. Tedeshi and M. Riess as conscious creation of a certain impression for other people [6], in this aspect has been studied in detail by I. Gofman [3]. V.M. Shepel [5] writes about the meaning of self-presentation considering the technology of self-presentation as a means for creating a personal image.

Creation of a required image during self-presentation on the social network page is possible due to such components as the character of the main photo, the user's personal name, as well as the contents of his/her personal information on the page (personal events, photos and videos in the archives, references, etc.).

Self-presentation in the network can have the purpose of solving the problem of search for one's own identity, conscious creation of personal image, as well as exchange/translation of implications and meanings to arrange interaction with other users or influence them. Representing one of the aspects of behavioral component of I-concept of a personality, self-presentation can serve as a means for elimination of contradictions in its cognitive and emotional-evaluative components.

Within the framework of our investigation we shall analyze the visualized image in self-presentation on the personal page of men and women – users of the social network from the point of view of its determination by peculiarities of their I-concept.

Hypothesis: self-presentation of men in a social network is to a greater degree directed on the business sphere, self-presentation of women is mainly directed on the personal sphere and communication; peculiarities of self-presentation of the user's personality in a social network are determined by the peculiarities of his/her I-concept.

Subject: peculiarities of I-concept of men and women – users of social networks.

Purpose: to investigate the interrelation of I-concept and self-presentation of men and women through personal information on personal pages of a social network.

Achievement of the purposes of the investigation supposes development of psychological contents of the notions "I-concept" and "self-presentation", discovery of possibilities of self-presentation of a personality in social networks, studying the information of respondents in the structure of self-presentation of a social network user and discovery

of qualitative differences in self-presentation of men and women in a social network.

The sample group comprised 60 people aged 25–35 years, of which there were 30 women and 30 men. During the first stage we have performed content analysis of the users' pages and carried out comparative analysis of the information contained therein with the purpose to discover specific character of the contents of men's and women's pages. The second stage of investigation assumed questionnaire survey with the purpose to analyze motivation of social networks use by men and women. The third stage of the investigation consisted in studying specific gender features of self-relation of the users. At the fourth stage we have carried out comparative analysis of main modalities of I-concept of men and women. At the fifth stage we have performed statistic processing of the investigation results.

The following methods have been used for the investigation:

1. Content analysis of the user page.

2. A questionnaire developed by us for discovery of formal characteristics of respondents and peculiarities in the use of social network.

3. A test-checklist on self-relation by V.V. Stolin, S.R. Pantileyev. This method is aimed at studying substantive aspects of emotional component of I-concept.

4. A method by T. Dembo – S.Ya. Rubinstein. In our investigation this method has been used for discovery of main modalities of I-concept (real I, ideal I, mirror I).

5. For detecting differences in parameters for different groups we have used Student's t-criterion.

The main results of the investigation

Based on the analysis of the contents of male and female user pages we can state the following: Women use their real photo in social networks less frequently than men do. The considerable part of respondents of both genders does without denotement of their status on the page. Giving personal information the majority of respondents of both genders prefer to give true information. Unlike men, women prefer quotations and philosophic utterances, whereas men tend to use humorous utterances. Both women and men rarely express their own thoughts on the wall, the main part of records on the wall are reposts. The contents of reposts have gender differences. Thus, for women of the greatest interest are love and children topics, for men – entertainment and personal achievements topics. Moreover, it needs to be mentioned that the most interesting categories for women are practically of no interest for men, and vice versa, categories in which men are interested, do not arouse women's interest.

Women spend considerably more time in social networks than men. Men and women name different most important reasons for visiting social networks. Thus, for women the main reasons for using social networks are watching photos and communication with friends. The most important reasons for men are using content and visiting online communities.

Upon average, women have more friends as compared to men, however women by far less frequently interact with their social network friends outside social network.

The results of the respondents' self-relation study using self-relation study method (SRSM) are given in Table.

Differences in the results of self-relation study using SRSM method between men and women by Student's t-criterion

Scale	women	men	Student's t-criterion
Openness	5,7	5,7	0,1
Self-confidence	6	5,9	0,3
Self-guidance	5,9	5,7	0,5
Mirror I	5,2	5,2	0,1
Self-value	6,9	6,3	1,3**
Self-acceptance	6,1	5,9	0,5
Self-attachment	4,2	5,4	2,5*
Proneness to conflict	5,4	4,8	1,5**
Self-reproach	6	5,9	0,9*

Note. Symbols legend: * – differences significant at the level of $p < 0,05$; ** – differences significant at the level of $p < 0,01$.

According to the table data, for women the most strongly marked feature of self-relation is self-value. The lowest average score for women is on the scale "Self-attachment". On the scale "Self-confidence" the average score is equal to 6. The obtained result characterizes women as people used to stability. They maintain high working efficiency only in a situation familiar to them, when difficulties arise, their mood becomes impaired, anxiety and uneasiness grow.

The average score on the scale "Self-guidance" is equal to 5.9. The obtained value testifies of the women's faith into dependency of their "I" from the external circumstances. Their self-regulation mechanisms are weakened, and willpower control for overcoming external and internal hindrances is insufficient.

On the scale "Mirror I" the average value is equal to 5.2. The average values on this scale speak to the fact that women have a selective relation to themselves and to others.

On the scale "Proneness to internal conflict" the average value is 5.4, which indicates that women are prone to reflection and self-analysis, having strict requirements to themselves, violation of rules of conduct leads them to conflict between "real I" and "ideal I". Unexpected difficulties promote increase of underestimation of own success.

On the scale "Self-reproach" the average value is 6, which also indicates that women reproach themselves for any particular behavior or actions in conjunction with showing vexation towards other people.

For men the most strongly marked feature of self-relation is self-value. The lowest average score for men was obtained on the scale "Proneness to internal conflict". On the scale "Proneness to internal conflict" the average score is equal to 4.8. The obtained result indicates that men are also prone to reflection and self-analysis.

The average value on the scale Self-confidence is equal to 5.9. The obtained result characterizes men as people used to stability. They maintain high working efficiency only in a situation familiar to them, when difficulties arise, their mood becomes impaired, anxiety and uneasiness grow.

On the scale "Self-guidance" the average value is equal to 5.7. The obtained value is within the range of average values on this scale, this testifies of the men's faith into dependency of their "I" from the external circumstances. Their self-regulation mechanisms are weakened, and willpower control for overcoming external and internal hindrances is insufficient. Such people tend to deny their guilt pointing at external circumstances as the source of everything that happens.

The average value on the scale "Mirror I" is equal to 6. The average values on this scale speak to the fact that men have a selective relation to themselves and to others.

The average value on the scale "Self-acceptance" equal to 5.9 indicates selective relation to themselves, when the person does not accept all merits and does not criticize all shortcomings.

On the scale "Self-attachment" the average value is 5.4. This value indicates selectivity of relationship to one's personal features. Men want to change certain features of their personality and keep other features.

On the scale "Self-reproach" the average value equal to 5.5 also indicates selective relation to oneself. The person reproaches himself for any particular behavior or actions in conjunction with showing vexation towards other people.

On some scales we can observe significant differences between the respondents.

Mathematical treatment of the investigation results showed significant differences on scales "self-value" ($p \leq 0{,}01$), "self-attachment" ($p \leq 0{,}05$), "proneness to conflict" ($p \leq 0{,}01$) and "self-reproach" ($p \leq 0{,}05$). This indicates reliably higher values of self-attachment for men and higher values of self-value and at the same time proneness to conflict and self-reproach for women.

For the analysis of reliability of differences for men and women in the data of T. Dembo – S.Ya. Rubinstein method, Student's t-criterion was used, which did not show significant differences for any modality of "I" concept.

Conclusions

1. Self-presentation on a social network page of men is to a greater extent directed on such spheres as achievement of goals, career ladder, success. Self-presentation of women is directed on dating, relationships, family, drawing attention to attractive appearance.

2. Peculiarities of self-presentation of men and women – social network users are determined by specific peculiarities of their "I-concept": for men the characteristic feature is self-attachment, women realizing their self-value, nevertheless are more prone to conflict and prone to self-reproach.

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GENDER-SPECIFIC DESIRES OF TODAY'S PRESCHOOL CHILDREN

Semenova L.E., Chevachina A.V.

Minin Nizhny Novgorod State Pedagogical University, Nizhni Novgorod, e-mail: annochka_v@mail.ru

The article deals with specific features of personality phenomena insufficiently studied so far: desires of preschool children and linkage between the subject matter of their desires and the conditions of social and cultural development of contemporary preschool children, in particular, with pressures in the course of differential gender socialization. The authors present the results of the comparative content analysis of desires of girls and boys in senior preschool age. Differences and similarities in the content aspects of the desires of children of opposite sexes are shown in concrete empirical data. General age-related and gender-related specifics of desires of senior age preschoolers are established. Indirect influence on the subject of children's desires through inherent in the modern Russian society individual cultural norms of femininity and masculinity, which are already starting to be followed by many girls and boys, are shown. Some nuances in the content of preschoolers' desires depending on the impact of the factor of social desirability are revealed.

Keywords: desires, senior age preschoolers, gender socialization, norms of femininity, norms of manhood

As asserted at the time by P.Y. Galperin, "every good psychology begins with child psychology". Therefore, it is not accidental that for many decades now the national psychology does not lose interest in the process of personality development in childhood, which in recent years has adopted a new – gender based point of view towards considering many traditional problems [4; 5; 7; 8; 10 etc.]. However, despite availability of a sufficiently large number of studies, there are still some "white spots" in modern psychology which may include among others the issue of desires, and, in particular, their gender specifics in relation to childhood.

It may be emphasized that till date the desires of an individual remain one of the least studied psychological phenomena. The only exception to this end, perhaps, is the work of P. P. Blonsky, in which an attempt was made to trace the process of the development of desires, specifics of their manifestation and nature of upbringing [3].

So, according to the interpretation of P.P. Blonsky, desire is a complex psychic formation, related to the activities in different psychic spheres – motivational, intellectual, emotional, and volitional. And, according to the author, the source of desires is in the collision between the needs and possibilities to satisfy them. "In case, writes P.P. Blonsky, we are not able to satisfy our needs, our aspirations turn into desires" [3, p. 116], whereas the desires themselves are the thought about the desirable, and the thought itself being emotionally charged and close to the action to the maximum extent. In other words, a desire represents a kind of synthesis of the intellect, emotions and will pertaining not to reality per se, but only to a potentially possible reality. At the same time it is known that the nature of human needs and possibilities of their satisfaction depend on those social and cultural conditions in which the human being lives. So, there is every reason to assert the fact of cultural-historic determination of the subject matter of desires or, to put it differently, the social construction of these motivational preferences associated with unmet needs.

Thus, the analysis of the content of desires allows us to obtain a lot of information about the inner world of a person, its individual life experiences and the nature of development as a representative of specific culture and social group, as well as about the socio-cultural environment in which this development takes place that is crucial in terms of optimization of the process of personality development with regard to the stages of early ontogenesis, in particular, the preschool period.

Purpose, hypothesis and research methods

Realizing the importance of studying children's desires and lack of information in contemporary psychology with regard to indirect influence of cultural gender-based norms and standards on their content, we conducted our own research aiming at a comparative analysis of content aspects of desires of girls and boys in senior preschool age. While sharing the view of modern experts on gender standardization of personality development in accordance with the existing in the culture tradition of gender polarization [1; 2, etc.] and considering the wide spread of differential gender socialization strategy in the Russian society [9], we assumed that the content of girls' and boys' desires along with age-related features relevant to the main tasks and social situation of development, would clearly manifest gender specifics as a result of gender-differentiated socio-cultural influences on a

child. As for the age of the subjects, its choice was determined by the following: by senior preschool age most children clearly realize their gender identity and, along with that, they have already acquired significant experience regarding gender-based behavior models acceptable and unacceptable from the point of view of prevailing norms in the culture, which is reflected in their aspiration to adjust their behavior so as to meet corresponding social expectations [2; 6; 8 etc.].

In total, our study involved 197 children, 5-7 year-old, including 101 girls and 96 boys.

Our study comprised of two series of individual problem-oriented psycho-diagnostics. The first series aimed at revealing hidden desires of the subjects, not influenced by the factor of social desirability. For this, we have used a projective technique "Tsvetik-Semitsvetik", based on the principles of fairytales. Children were asked to recall the contents of the fairytale by V.P. Kataev, heard by the children at the preliminary lesson, and then to compose a story similar to its plot, the hero of which was a girl or a boy, according to the sex of the subject. The wishes were made on behalf of the main hero/heroin named by the child himself/herself. In doing so we proceeded from the idea of the ability of children to project their inner experience, feelings, vital needs and desires on to their protagonist with whom they identified themselves. Besides, we also believed that modelling by the subjects of a fairy-tale plot would greatly facilitate them the process of expressing their main desires, reducing the possible "internal censorship" and the influence of social desirability factor. The second series of the study was conducted at re-meeting with the subjects 3–5 days later and was aimed at the study of openly verbalized desires of senior preschool children, taking into account the probable influence of their "internal censorship" and the factor of social desirability. To this end, we used the same technique, but without the elements of projection: the children made wishes on their own behalf.

All results obtained from the study were processed using content analysis, based on the categories pre-selected by the group of experts (vide Table). Having established the frequency of occurrence of each category in the subjects' statements, we carried out a comparative content analysis of girls' and boys' desires in the first and second series of the study using the criterion φ^* –Fischer's angular transformation. In the course of the study we managed to collect 2624 desires.

Results of the study and their discussion

The results obtained are briefly described herein under and are reflected in the table.

So, as it might be seen from the table data, the contents of desires of boys and girls of senior preschool age have certain specifics due to differentiated practice of social pressures aimed at children of different sexes. This fact finds its confirmation in the statistically significant differences in the categories corresponding to gender stereotypes, and is a testimony to the process of acquiring by pre-school children of gender norms existing in the society.

Thus, the girls participating in our study, didn't speak at all about their aspiration towards emancipation, and very rarely mentioned improving of physical qualities and athletic abilities, i.e., those characteristics that traditionally are not referred to the standards of "normative femininity". At the same time, they more often than boys turned over to the theme of appearance in terms of attractiveness and its accessories (clothing, ornaments, cosmetics), as well as to their potential family roles, specifically focusing on those aspects that are the main components of a traditional female image ("long hair", "to wear high-heel shoes", "red lipstick to paint lips", "to have a daughter", etc.).

As for the boys, for the majority of them, on the contrary, of special value were desires falling under the category "health / physical qualities and athletic abilities", which, in our view, is a consequence of acquiring by them of widely spread in our society socio-cultural standards of masculinity associated with a norm of physical stamina [2] ("to be the strongest", "to be able to fight back", "to become a world champion in ski jumping", etc.). In addition, some boys, unlike the girls, were found to aspire for emancipation, which can also be regarded as a consequence of the orientation of preschoolers towards the known social norm of male independence ("to be allowed to do whatever I want", "not to ask anybody's permission", etc.).

Also noteworthy is the fact that compared to the girls, their male peers mentioned often enough their achievements (a norm of social success as one of the landmarks of male socialization [2]) and the desire to prove their superiority over others which, judging by the subjects' own comments, is caused by the presence of competitive tendencies, the need to be the first, the best, the boss ("that everybody should obey", "to conquer everybody"), i.e. those motives that, as per the data found in literature, become of paramount importance in the boys' community [4].

The gender-wise specifics of senior preschoolers' desires

Category	Subjects	% of mentions from the total number of desires	
		1st series	2nd series
Magic wishes	Girls	4,85	4,4
	Boys	4,8	5,0
Socially significant desires	Girls	4,1	4,6
	Boys	3,3	4,0
Material well-being	Girls	3,7	3,3
	Boys	4,3	3,9
Family/relatives	Girls	8,7	8,7
	Boys	8,6	8,7
Professional roles and achievements	Girls	2,85	2,6
	Boys	3,7	4,0
Family roles	Girls	1,6*	1,9**
	Boys	0,6	0,3
Interaction with adults	Girls	3,2	3,9
	Boys	3,3	2,9
Interaction with their own sex peers	Girls	2,7	2,4
	Boys	3,6	3,5
Interaction with the opposite sex peers	Girls	–	0,4**
	Boys	–	–
Toys and sweets	Girls	11	11,7
	Boys	12,6	13,2
Clothes, ornaments, cosmetics	Girls	8,1**	7,7**
	Boys	1,1	0,4
Technical appliances and useful items	Girls	6,7	7,2
	Boys	9,9*	10,7*
Animals	Girls	3,2	4
	Boys	2,3	2,6
Entertainment/travels	Girls	6,1	5,4
	Boys	7,9	7,4
Gift for their own sex peers	Girls	1,7	3,3
	Boys	2,9	3
Gift for the opposite sex peers	Girls	1,15	1,3*
	Boys	0,5	0,4
Gift for adults	Girls	6,7	7,3
	Boys	6,0	6,3
Emancipation	Girls	–	–
	Boys	1,2**	0,9**
Refusal to work and communicate	Girls	3,0	2,6
	Boys	4,5	2,7
Appearance	Girls	3,4**	3,1**
	Boys	0,2	0,4
Intelligence, abilities and academic competence	Girls	1,5	1,4
	Boys	1,2	1,4
Health/physical qualities and athletic abilities	Girls	1,15	0,9
	Boys	3,4**	4,0**
Socio-demographic characteristics	Girls	1,7	1,4
	Boys	1,2	0,8
Skills and abilities	Girls	2,4	2,5
	Boys	2,2	2,3
Changes in their own sex peers	Girls	2,0	1,7
	Boys	2,3	2,6
Changes in adults	Girls	5,1	3,9
	Boys	4,2	5,0
General view characteristics	Girls	2,4	2,3
	Boys	2,8	3,2
Return to the past	Girls	1,0	0,1
	Boys	1,4	0,4

N o t e . * – differences significant at $p \leq 0,05$; ** – differences significant at $p \leq 0,01$.

Along with that, the results of the comparative analysis of the girls' and the boys' statements revealed a rather curious feature that read as follows: when there were a rather pronounced tendency to manifest their commitment to future professional achievements (especially in the 2nd series of the study, where openly verbalized desires were formulated), many boys more often than girls, demonstrated hidden desires to avoid activities and communication. We are of the opinion that this kind of situation may be a consequence of the fact that a man and his activities, as a rule, are excluded from the daily life experiences of contemporary children (including boys), and what is typically done before the eyes of a child, in what he is involved (including kindergarten activities) comes from women. That is why many boys, probably guided by the cultural norm of antifemininity [2], prefer to ignore the activity that they think is not for men, and confirmation to this effect is found in their responses under the category "refusal to work and communicate" ("not to wash dishes", "not to be on duty with girls", "not to attend music classes", "not to do any kind of nonsense", etc.). On the contrary, if we speak of desires pertaining to travel and entertainment, they possessed a higher degree of importance for boys, and this was observed both in the first and the second series of the study.

Besides, the priorities of senior preschool boys included desires related to technical appliances and useful things ("I would ask Tsvetick for a "Ferrari", "scuba diving items", "the most powerful computer", etc.). And, contrary to the girls, wishing for "cute trinkets" – "a jewel box", "a piano", "a looking glass with a handle", etc., their male peers among the useful things, in addition to weapons, usually named cars, sports equipment and various tools, the use of which as well as the interest in technical items in general, is regarded by many and, above all, by the men themselves as a significant indication of "real" manliness [4] ("a short gun", "a real hockey stick and skates", " muscles training unit", "football", "screwdrivers set", etc.).

Thus, summarizing the above, it may be noted that by the end of preschool age the subjective experience of a child begins to reveal social pressures of differentiated gender socialization, as is evidenced by the emerging tendency of orientation towards gender stereotypes prevailing in our society. They gradually enter children's minds and, consequently, begin to show themselves up in the content of some desires of senior preschoolers.

However, it should be noted that apart from differences identified by us in the content of the boys' and girls' desires, some common features arising out of the specifics of their age, social situation of development and leading type of activity, have also been found out. In particular, we became confident that regardless of sex all of our subjects equally valued as important a family and happy atmosphere within a family ("so that mother and grandmother would not quarrel", "daddy came back", "a brother was born to me", etc.), toys and sweets ("the most delicious ice cream" "kinder surprise toys", "puzzles with a thousand pieces and a dog", etc.). Moreover, almost as often children talked about their magic wishes ("to learn to fly", "to become a magician and to fulfill any wish all by myself", "self-placing into cupboard toys") as well as about skills and abilities, although in terms of content the last category of the preferences of the girls focused mainly on domestic skills and artistic abilities ("to learn to cook pancakes", "to sew like my mom"), whereas the boys' preferences indicated their desire to master mainly technical skills ("to learn how to assemble a computer", "to drive a real car" "to be able to repair a bike"). We believe that this kind of children's orientation is quite understandable, since in this case we are talking about the interests and activities that are at par with the norms of femininity and manhood existing in our society.

Conclusion

Thus, summing up the above study, it may be concluded that the analysis of the desires' content really makes it possible to get valuable information about the inner world of children, specifics of their personality development where general age tendencies are complemented not only and not so much by the influence of the child's individual life experience but of differentiated gender socialization. In other words, being a phenomenon of individual consciousness, children's desires bear the stamp of the socio-cultural environment, its various norms, including gender standards of behavior, the reflection of which can be found in quantitative and qualitative characteristics of motivational preferences of senior age preschoolers, which in turn confirms our hypothesis.

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GENDER STEREOTYPES IN THE LOCAL LABOR MARKET

Koryakovtseva O.A., Talanov S.L.

Yaroslavl State Pedagogical University, Yaroslavl, e-mail: youth1@mail.ru, talanov_sergei@mail.ru

The authors analyzed various types of gender stereotypes prevalent among the citizens of Yaroslavl. It is concluded that out of nine kinds of gender discrimination traditionally common for the Russian labor market, the following three types of gender discrimination are mostly proliferated in Yaroslavl: "salary inequality", "lack of women in managing positions", "obstacles in professional advancement". It is proved that women's work in the mind of a large part of the population, regardless of its gender-specific, is estimated lower than men's one. The gender imbalance is revealed: the major part of men are perceiving women's low salary as a norm. A substantial part of women feels that their work should be assessed at least at the same level as men's. In addition, it was found out that the involvement of women in household routine significantly impedes their professional advancement. Moreover, major part of women are even not going to build a career, if everything goes well in their families. For managing positions, women are lack of ambitions and perseverance in targets' achievement.

Keywords: gender discrimination, labor market, women, career, "glass ceiling"

Relevance of research

Positional experts note an increase in all forms of gender discrimination in the labor market. Unfortunately, the labor market of Yaroslavl is not an exception [2].

The results of previously made sociological polls show that the stereotypes, that the most important things for women is family and everything related to it, are still vastly represented in the society. It is appropriate to quote B.S. Turner who noted "… a system of power relations of men over women is that, because of their reproductive role in human societies…" [3].

Considering the foregoing, we have attempted to study gender stereotypes in the local labor market.

Empirical base of research

Object of study – able-bodied population of Yaroslavl (women aged 18 to 54 years old, men aged 18 to 59 years old).

Subject of study – opinion of the citizens of Yaroslavl about the problem of women discrimination in the labor market.

Method of information gathering: survey.

Sample n = 312.

Main method of research implementation: territorial (street) survey.

The mathematical processing of the data has been made with the use of the software: MS-Excel and SPSS-19. The selection of criteria for the processing took place after checking the distribution of the results for each scale for normal distribution. K-Z Kolmogorov-Smirnov criteria has been used to check the normality of distribution. The distribution of more than 30 percent of studied features in the sample deviates from the normal, so to assess the significance of differences Mann-Whitney U-Test has been used; for a correlation analysis – Spearman's rank correlation coefficient. After calculating the correlation coefficient, we determined p- level of significance.

Materials and methods of research

Theoretical and methodological basis of the study stands on such theories as structuralism, phenomenology, and the dispositional approach, as well as the studies of such authors as Jacqueline Watts [4] and Susan Bordo [1].

Author's hypothesis:

1. Women's work in the mind of a large part of population, regardless of its gender-specific, is estimated lower than men's one. The difference is only in the fact that the major part of men are perceiving women's low salary as a norm. A substantial part of women feels that their work should be assessed at least at the same level as men's.

2. The involvement of women in household routine significantly impedes their professional advancement. Moreover, major part of women are even not going to build a career, if everything goes well in their families.

3. For managing positions, women are lack of ambitions and perseverance in targets' achievement.

Results of research and their discussion

First, we attempted to verify the first hypothesis, that "women's work is estimated lower than men's one".

More than half of respondents (58%) believe that salaries depend primarily on work experience, qualifications, and not on the gender. On the other hand, 42% of respondents believe that the salary for equal complexity work will be higher for men.

The more often a woman and her friends/relatives have faced the problem of discrimination in the labor market, the more respondents believe that the salary for equal complexity work will be higher for a man ($r = 0{,}223$ with $p \leq 0{,}05$ and $r = -0{,}238$ with $p \leq 0{,}05$). The more seldom they have faced such problems, the more respondents believe that the salary depends primarily on work

experience, qualifications, and not on the gender ($r = – 0,223$ with $p \leq 0,05$).

Respondents who answer that a man is easier to get a job, find that the salary for equal complexity work will be higher for a man ($r = 0,349$ with $p \leq 0,001$), and respondents who answer that the labor market has no preference for gender, believe that the salary depends primarily on work experience, qualifications, and not on the gender ($r = 0,263$ with $p \leq 0,05$).

Assuming that the employer prefers men to women, because men are more ambitious, and the fact that women can take maternity leave at any time, the respondents believe that the salary for equal complexity work will be higher for men ($r = 0,283$ with $p \leq 0,01$ and $r = 0,331$ with $p \leq 0,01$).

Thus, Yaroslavl citizens believe that the relationship between salary and gender exists. They assume that women's work is estimated lower than men's one. The more women have faced the problem of discrimination in the labor market, the more Yaroslavl citizens believe that the salary for equal complexity work will be higher for men.

Then we tested the hypothesis number 2, that "the family prevents women to build a career".

The majority of respondents think that the chances of men/women for career growth and advancement depend on working conditions – 45 %, but almost the same percentage – 42 % – believe that the chances are not equal, and men have more chances to grow; 8 % believe that the chances for men/women's professional advancement are equal; and 5 % of the respondents find the question difficult to answer. Nevertheless, no one thinks that there are more chances for women.

The more respondents think that men have better chances for professional advancement and promotion, the more relevant they consider the issue of discrimination against women in the labor market ($r = 0,284$ with $p \leq 0,01$), and the more the respondents believe that the chances of men/women depend on the working conditions, the less relevant they consider this problem ($r = – 0,255$ with $p \leq 0,05$).

Women are more likely to think, that opportunity for career growth depends on working conditions ($U = 620,500$ with $p \leq 0,001$). The more often women and their friends/relatives have faced the problem of discrimination in the labor market, the more respondents think that men have better chances for professional advancement and promotion ($r = 0,372$ with $p \leq 0,001$ and $r = 0,507$ with $p \leq 0,001$). The more seldom they have faced such a problem, the more respondents believe that the chances of men/women depend on the working conditions ($r = – 0,262$ with $p \leq 0.05$ and $r = – 0,403$ with $p \leq 0,001$).

Men are more confident that they have a better chance for career growth ($U = 620,500$ with $p \leq 0,001$). Those who are not aware of cases of discrimination against women in the labor market, mostly answer that women have better chances for professional advancement and growth ($r = 0,325$ with $p \leq 0,01$).

Assuming that it is easier for men to get a job, respondents answer that men have better chances for career growth and promotion ($r = 0,625$ with $p \leq 0,001$), and if they believe that the woman-candidate has the advantage in front of a man, then they reply, that women have better chances for professional advancement and promotion ($r = 0,692$ with $p \leq 0,001$). Assuming that the labor market has no preference regarding the gender, the respondents answer that the chances of men/women depend on the working conditions ($r = 0,514$ with $p \leq 0,001$).

Respondents who answer that men have greater chances for career growth and advancement, believe that the employer prefers men, because woman can take maternity leave at any moment ($r = 0,605$ with $p \leq 0.001$), and those who are replying, that the chances of men/women in the labor market are equal, find it difficult to answer the question: "What do you think, why the employer often prefers men than women?" ($r = 0,240$ with $p \leq$ at 0,05).

Accordingly, if the respondents believe that men have better chances for their professional advancement and promotion, they assume that the salary for equal complexity work will be higher for men ($r = 0,253$ with $p \leq 0,05$).

73 % of respondents believe that women have difficulties with building a career because of the family and the complexity of its alignment with the career, 22 % believe that the difficulties are because of the psychological complexes of women themselves, and only 5 % of respondents believe that difficulties are connected directly with discrimination against women in the companies.

Women are more confident that they are impeded to build a career by their psychological complexes ($U = 901,500$ with $p \leq 0,001$). Not facing the discrimination in the labor market personally, they suggest that women have difficulties with building a career because of the family and the complexity of its alignment with the career ($r = 0,225$ with $p \leq 0,05$). However, there are those who have faced this problem, and they suggest that women

are impeded to build a career directly because of discrimination in their companies ($r = 0,260$ with $p \leq 0,05$).

Men are more confident that women have difficulties with building a career because of the family and the complexity of the alignment, and they also are more confident that the discrimination in companies prevents women to build a career ($U = 921,000$ with $p \leq 0,05$ and $U = 1034, 000$ with $p \leq 0,05$). Those who are more aware of cases of discrimination against women in the labor market, respond that women have difficulties with building their career because of their psychological complexes ($r = 0,260$ with $p \leq 0,05$).

If the respondents answer that the employer prefers men, because men are more confident, they believe that women are prevented to build a career because of their psychological complexes ($r = 0,322$ with $p \leq 0,01$). If the respondents answer that the employer prefers men, because women can take maternity leave at any time, they believe that women are prevented to build a career because of their families and the complexity of alignment with the career ($r = 0,222$ with $p \leq 0,05$). Moreover, if the respondents answer that the employer prefers men, because men are predictable, they believe that women are prevented to build a career because of discrimination against women in the companies ($r = 0,294$ with $p \leq 0,01$).

The more respondents believe that women have difficulties with building their career because of their families and the complexity of alignment with the career, the less they believe that women-candidates have an advantage over men in the labor market ($r = – 0,212$ with $p \leq 0,05$).

When answering the question: "Do you agree with the fact that maternity leave is a step back in a woman's career?", the respondents mostly believe that maternity leave really has a negative impact on the career of women – 67%, 24% find it difficult to answer this question, 6% believe that maternity leave does not interfere a woman to succeed in her career, and 3% believe that child care can even be a major undertaking in a woman's career.

Often women themselves find it more difficult to answer this question than men ($U = 876,000$ with $p \leq 0,01$). They want to believe that maternity leave will affect their professional career in no way.

Men who are not aware of cases of discrimination against women in the labor market, also find it difficult to answer the question about women's maternity leave ($r = 0,392$ with $p \leq 0,001$). But those who have faced such issues in their life, respond that maternity leave has a negative impact on the career of women ($r = – 0,373$ with $p \leq 0,001$).

Those respondents who believe that a man is easier to get a job also agree the statement above ($r = 0,274$ with $p \leq 0,01$). Respondents who believe that a woman-candidate has an advantage over men in the labor market, answer that maternity leave does not impede a woman to succeed in a career ($r = 0,205$ with $p \leq 0,05$); and those who find it difficult to answer the question, believe that there is no preference for gender ($r = 0,230$ with $p \leq 0,05$) in the labor market.

Of course, the more respondents believe that employers prefer men because women can take maternity leave at any time, the more they respond that maternity leave has a negative impact on a woman's career ($r = 0,236$ with $p \leq 0,05$). However, the less they think like this, the more difficult they find it to answer the question: "Do you agree with the fact that maternity leave is a step back in women's career?" ($r = – 0,294$ with $p \leq 0,01$).

Assuming that men and women have an equal chance in professional advancement, the respondents answer that maternity leave does not impede a woman to succeed in her career ($r = 0,230$ with $p \leq 0,05$).

Men and women who think that women are prevented to build a career because of their families and the complexity of alignment with the career, note that maternity leave has a negative impact on the career of women ($r = 0,209$ with $p \leq 0,05$).

Based on the foregoing, we can conclude that the chances of men and women to advance their careers depend on the working conditions.

Those respondents, who believe that there is no preference regarding the gender in the labor market, answer that the chances of men and women for career growth depend on the working conditions.

The main reasons for lack of demand for women in employment cause the problems of their professional advancements. The respondents, suggesting that employers prefer men because men are more confident themselves, believe that women have difficulties with building their career because of their orientation on birth giving. Most men and women who believe that that women are prevented to build a career because of their families and the complexity of alignment with the career, think that the more children a woman is planning to have, the more maternity leave and child care will constantly distract a woman in building a successful career.

Then we have checked the hypothesis number 3, "For leadership positions, women are lack of ambitions and perseverance in targets' achievement".

If getting a new job, your boss is likely to be a man – 31 % of respondents, a woman – 5 %, 22 % do not care who will be their boss, but the majority – 42 % – say that it all depends on the situation and the first impression and from the level of professionalism of the boss. According to respondents, the male-boss is better than a female-boss because he is more confident, it is easier to find a common language, he is more balanced, ambitious and more effective, he will take a right decision in critical situations. Those who prefer to see their boss as a woman believe that female-boss is better because she works with enthusiasm, involves emotions, kindness, and care.

Women are more confident that they want to see their boss as a man ($U = 704{,}500$ with $p \leq 0{,}001$). Facing with discrimination in the labor market, the woman and her friends/relatives still believe that they would like to have a male-boss ($r = -0{,}334$ with $r \leq 0{,}001$ and $r = -0{,}243$ with $p \leq 0{,}05$). This is affected by stereotypes regarding to the boss' gender. The more women and their friends/relatives have not faced the discrimination in the labor market, the more respondents believe that the person, they would like to see as their boss, will depend on the situation, the first impression, the level of his/her professionalism ($r = 0{,}209$ with $p \leq 0{,}05$ and with $r = 0{,}293$ $p \leq 0{,}001$).

Men are more confident in the fact that the selection of the boss' gender depends on the situation and the first impression ($U = 739{,}500$ with $p \leq 0{,}001$). Those who are not aware of cases of discrimination against women in the labor market, believe that they would like to see their boss as a man ($r = 0{,}260$ with $p \leq 0{,}05$).

Respondents aged 31-40 are more confident in the fact that the selection of the boss' gender depends on the situation, the first impression, the level of professionalism of the boss ($U = 286{,}000$ with $p \leq 0{,}05$).

30 % of respondents think that women have lack of self-confidence to occupy the managing positions, 22 % think that not skilled enough to represent themselves and their ideas correctly, and 22 % think that sometimes they are not enough determined, 15 % consider that they are not rigid enough, and 11 % think that they don't have enough of psychological stability. As you can see, opinions are different.

Those who respond that women do not have enough of psychological stability to occupy the managing positions, consider the problem of discrimination of women in the labor market as more relevant ($r = 0{,}523$ with $p \leq 0{,}001$).

Women are more confident in the fact that they have lack of self-confidence to occupy the managing positions ($U = 525{,}000$ with $p \leq 0{,}001$). The more the woman and her friends/relatives have faced with the problem of discrimination in the labor market, the more respondents believe that to women do not have enough of psychological stability ($r = 0{,}249$ with $p \leq 0{,}05$ and $r = 0{,}293$ with $p \leq 0{,}01$) and self-confidence ($r = -0{,}563$ with $p \leq 0{,}001$ and $r = -0{,}399$ with $p \leq 0{,}001$) to occupy the managing positions.

Men are more confident in the fact that women have lack of rigidity ($U = 828{,}500$ with $p \leq 0{,}01$) and psychological stability ($U = 849{,}000$ with $p \leq 0{,}01$) to occupy the managing positions. Those who are more aware of cases of discrimination against women in the labor market, suggest that women have lack of self-confidence to occupy the managing positions ($r = 0{,}237$ with $p \leq 0{,}05$).

Of course, those who thinks that the employer prefers men, because men are more self-confident, respond that women have lack of self-confidence for managing positions ($r = 0{,}234$ with $p \leq 0{,}05$). But those who consider that the employer prefers men, because men are more functional and psychologically stable, respond that women have not enough determination for managing positions ($r = 0{,}230$ with $p \leq 0{,}05$).

Respondents, who suggest that women have difficulties with building their career because of their psychological complexes, believe that women have lack of self-confidence for managing positions ($r = 0{,}204$ with $p \leq 0{,}05$).

The more respondents want to see their boss as a man, the more they find that woman is not enough self-confident for the managing positions ($r = 0{,}336$ with $p \leq 0{,}01$).

Respondents aged 18-30 are more confident in the fact that a woman has not enough of psychological stability, ambition, determination to occupy the managing positions ($U = 422{,}500$ with $p \leq 0{,}01$).

Thus, only 5 % of respondents would like to their boss as a woman. The majority prefers to see its boss as a more ambitious and resolute person. Respondents believe that all these qualities are more inherent to a man.

Conclusion

In the framework of the study, it is found out that for the majority of the citizens of Yaroslavl is still inherent to gender stereotypes. Only a small part of the women

surveyed–7%–indicatedthattheyfacedthiskind of discrimination, such as "sexual harassment in the workplace". 17% of women indicated that they faced discrimination during the employment. It is concluded that out of nine kinds of gender discrimination traditionally common for the Russian labor market, the following three types of gender discrimination are mostly proliferated in Yaroslavl: "salary inequality", "lack of women in managing positions", "obstacles in professional advancement".

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COMPUTER MODELING AND ADVANCED FURNACE PROCESSING TECHNOLOGY IN ELECTRIC STEELMAKING

Belonozhko S.S., Gricaj I.P.
Don State Technical University, Rostov-na-Donu, e-mail: serzh_belonozhko@mail.ru

This article describes the design of a modern vacuum degassing of casting ladles ensuring the standard weight of steel in the ladle by reducing velechiny "of free Board". The model presented in this article made in the program "Compass-3D" made models of the extensions to the vacuum vessel and a comparative finite element analysis using the methods of vacuum refining is a necessary condition for improving the quality of produced steel of a number of brands. In particular, the steel processing in vakuumatora became the main, a mandatory part of the process of smelting bearing, electrical, autopistol steels. as we know vacuum treatment provides high quality casting machine for continuous casting of metal of responsible purpose, improving the quality of slabs and billets and reduce their rejection by macrostructure and surface defects, and increase steelmaking efficiency.

Keywords: electric furnace steelmaking, steel, ladle metallurgy, vacuum, vacuum degasser, degassing, free board computer modelrovanie, finite element analysis

Computer modeling and advanced furnace processing technology in electric steelmaking

Using methods vakuumno¬go refining, in essence, it is a necessary condition for improving the quality of steel produced a number of brands. In particular, treatment of steel in the vacuum degassing has become a major, a mandatory part of the process of smelting pro¬tsessa bearing, electrical, avtolistovoy steels. Vacuum casting process ensures high quality on-duty metal casters, quality improvement clyabov and billets and the reduction of their rejection by the macrostructure and surface defects, increased productivity steelmaking units, a decrease in volume and utilization of equipment for termoob¬rabotki, reduced consumption of ferro-alloys and deoxidizing agents, elimination of the marriage on the chemical composition and reducing the anisotropy of mechanical properties of finished steel, a minimum spread of rolled metal properties from heat to heat.

When the metal in the ladle vacuum treatment ladle is placed in a sealed chamber from which the steam jet pump is evacuated to a residual pressure of 0.133 kPa. By reducing the pressure of non-deoxidized metal boils to form CO. Due mixed metal boil, thereby equalizing the temperature and chemical composition, as well as the removal of hydrogen, nitrogen and nonmetallic inclusions. The chamber for vacuum processing of a steel housing with a sealed lid, with hoppers materials. Inside the casing and cover futeru¬yut refractory materials. To create a vacuum above the metal (vacuum) used steam jet pumps and a capacity of 400 kg / h of dry air.

The treatment is carried out in a vacuum casting ladle slide with 500 ... 700 mm headroom height with basic or high-alumina lining heated before the release of melting up to 1100 ... 1200 °C. Evacuation accompanied by AK Steel kipeni¬em weak and poor metal stirring, so buckets equipped with means for blowing argon melt. Several designs predus¬matrivayut ladle on the platform, and cover them with lids vacuum-wire equipment for dispensing kont¬rolno materials and instrumentation.

Analysis of the data in our possession shows that the major structural defect ladle degasser is a problem with the value of "free board" ladle.

For example, in [7] shows the effect of the size of the reaction zone workspace chipboard intensity Purge al. Process parameters on the formation of splashes and splashing furnace walls. It is shown that the resulting empirical relationships can be used to study mechanisms of spraying in actual steel assemblies, including, for secondary treatment and corrected for the elements of similarity theory.

To eliminate overflow and splashes across the board in the ladle furnace treatment is necessary to increase the height of free board ladle to 1200-1300 mm, which can handle only melting at 10-15 % less weight than the standard bucket seats. This problem is especially acute for metallurgical plants built earlier, where the conduct of the vacuum refining technology was not provided in the steel ladle, and hoisting machines and metal structures are designed for standard bucket mass, ensuring safe transportation. In the case of use in such production technology vacuum VD or VOD has to produce melting of reduced weight, which leads to a decrease in productivity and increase in cost of production. In the construction of new production, providing application or VOD VD installations for use in steelmaking unit

capabilities full bucket falls significantly increase the size and accordingly all the mechanisms and the whole building, which leads to a significant increase in capital costs. In this connection, vacuum is provided a method of refining steel in a ladle, tube and device for its implementation [8]. Schematic diagram of the vacuum process began with the new development is shown in Fig. 1.

To solve the problem of magnitude reduction freeboard applied fundamentally new approach, which uses the separation chamber vacuum space into two zones with different vacuum. At the same time, extension, which rests on the flange vacuum chamber with the necessary gaps with respect to the end and side of the bucket, made with the lined pipe. The length of the nozzle is selected so that during the vacuum treatment with a lower end immersed in the slag-metal emulsion rising to a certain depth, thereby dividing the inner space of the chamber into two zones with different degrees of dilution, the extension is in the vacuum zone is higher than under it. When lifting the slag-metal emulsion no overflow across the board is provided as a result of the hydraulic shutter effect when lifting the boil and slag-metal emulsion occur mostly inside the nozzle, the volume of which is selected based on the conditions of guaranteed exclusion of its overflow through the upper end of the pipe. Thus the rise of metal and slag in the ladle the area between the pipe flange and is practically absent.

It is found that after evacuating and lifting height of the metal with the slag outside the nozzle does not exceed 100–150 mm against 700 ... 1000 mm from the inner pipe adapter. This demonstrates that the process of boiling and heavy metal during vacuum degassing occurs in the nozzle, therefore the height of freeboard ladle can be greatly reduced. Comparison evacuation systems from the standpoint of economic efficiency types of [9] leads to the conclusion that the capacity ladles at 10-300 m depth ratio of metal to the ladle diameter (H / D), equal to 1: 1, the ratio of surface area to volume (S / V) is reduced from 8 to 1,5.Kak consequence empirical average temperature drop rate of alloys in ladles of small capacity is more than 6 dg / min in large ladles reaches 1.2 dg / min. conclusion can be drawn from this that the problem of reducing the magnitude of the free board becomes particularly important when processing small batches of mass in the case of relatively large installation volume resistivity (Fig. 2).

Computer modeling allows you to explore the features of the design of metallurgical equipment at the stage of development and design, which reduces the likelihood of errors at the manufacturing stage.

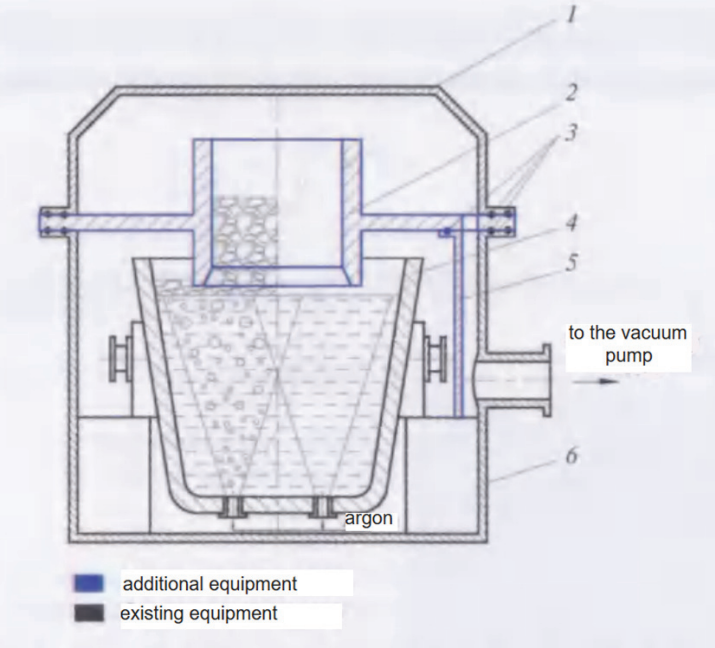

Fig. 1. The concept VODF process [8]: 1 heat shielding cover; 2 – extension; 3 – seal; 4 – casting ladle; 5 – insertion; 6 – vacuum chamber

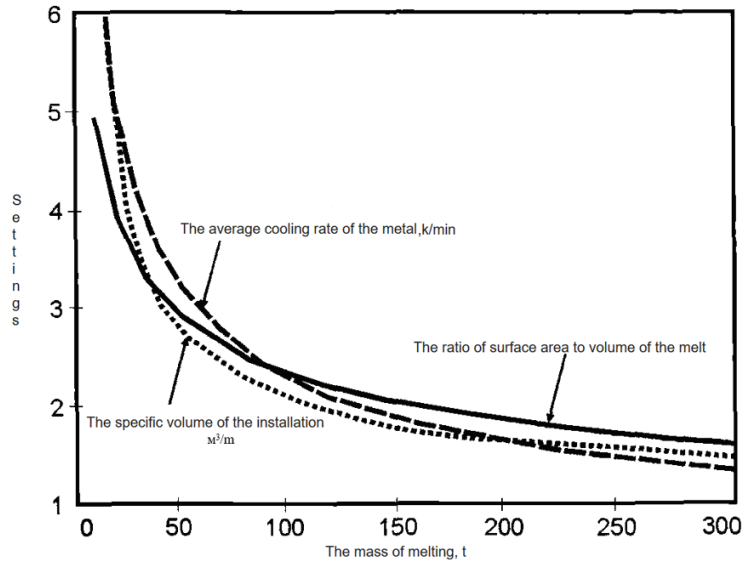

Fig. 2. Effect of weight of steel in ladle on the technological parameters of vacuum

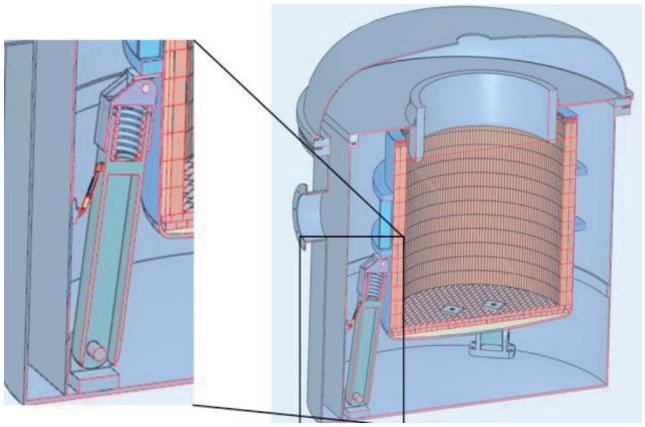

Fig. 3. Modl vacuum chamber for VODF process

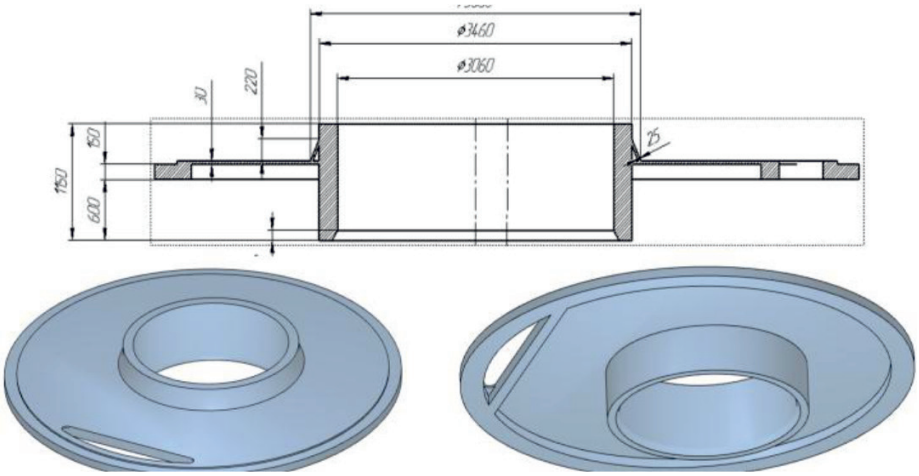

Fig. 4. provided by the present structure of the spacer

The CAD "3D Compass" we have created a vacuum vessel model and a spacer designed to satisfy discussed above. In this construction, the outer bearing ring and are connected by a membrane tube made of a steel plate and reinforced ribs. Finite analysis of the structure showed that when exposed to a temperature in the spacer will arise voltage, the value of which exceeds the strength of the metal. Dangerous sections are air channel edges, attaching the membrane to the stiffeners and pipe attachment points to the membrane.

There are also significant thermal deformation of the membrane, the nature of which is shown in Fig. 3.

We have proposed a spacer structure shown in Fig. 4. Rejecting the ribs, we propose to strengthen the place of critical stresses. Airway aperture reinforced bottom beam, which also serves as an additional seal in sealing degasser and fixing membrane reinforced discharge nozzle ring.

Finite analysis shows (Fig. 3) that under equal other conditions the voltage of the proposed structure of the spacer is smaller and distributed more evenly over the volume. Furthermore, in the present embodiment, thermal deformation is significantly reduced, and above all – are completely absent in the air passage area. Mass of the proposed construction of 37 tons, 5 tons less than the base.

As part of the educational work, contact was also modeled the vacuum chamber (Fig. 6) for VODF-process, a feature of which is that it can take buckets of different diameters due to variable geometry bearing struts. The maximum design load on the strut of a total of 500 tons, and chamber dimensions are designed to accept standard bucket capacity of 100-300 tons. This design of the vacuum chamber is more versatile and allows to easily move to another vessel buckets.

Application considered degasser design allows not only to intensify the process of vacuum metal, but also increase the melting mass of 10–15 tons by reducing the height of the free board. In addition, the ability to install different sizes of buckets increases the versatility of the machine, it can be used without adjustment for different working conditions.

Conclusions

The design of the installation of modern vacuum degassing ladle, which provides a standard weight of steel in ladle by reducing the amount of "free board". It is shown that the average weight of each melt processed on a degasser for molten steel VDF / VODF technologies can be increased by about 15 % compared with traditional VD / VOD technologies, thus decreasing the thermal load increases and resistance ladles; due to a more powerful mixing of the molten metal with slag reduces the time required processing cycle began, improved metallurgical characteristics of the final product and reduced energy consumption.

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REGULARITIES OF FORMATION OF SHOCK-ABRASIVE LOADS IN MAGNETIC LIQUEFIED LAYER OF ELECTROMAGNETIC MECHANOACTIVATION

Bezzubceva M.M., Volkov V.S.

St.-Peterburg Agrarian University, St.-Peterburg, Pushkin, e-mail: mysnegana@mail.ru

This article is devoted to the problem of creating energy-efficient mechanoactivation by forming specified in the conditions of production of the energy and power conditions in the working volume of the apparatus. Presents the results of mathematical simulation of the process of the formation of dispersive shock-abrasive loads between the grinding ferroaluminum in structural groups through the layer of the processed material. Studies were conducted taking into account probabilistic aspects of particle size reduction of product in electromagnetic mechanoactivation.

Keywords: energy efficiency, electromagnetic mechanical activators

The process of grinding solids represents a major scientific and technical problem caused by the lack of a generalized theory, thoroughly explaining the process and giving a precise mathematical apparatus for designing grinding equipment, meet the requirements of production in terms of efficiency and selectivity [1]. In this regard, the products of different grinding high energy consumption. As a result of comprehensive research revealed a mismatch between technological and physically-based energy consumption of the mills at all stages of dispersion and mechanical activation. To solve this pressing problem requires a qualitative shift to the design of the grinding device, based on the principles of providing maximum approximation of the energy consumed by the device from the network to the physical-based energy, given the hardening of particles with decreasing size in the milling process [2]. On the basis of theoretical and experimental studies, adaptive systems, providing a balanced and controlled energy effect on the particles of the comminuted product are solenoid mechanoactivation (EMMA). The study of regularities of formation of shock-abrasive loads in magnetic liquefied layer of electromagnetic mechanoactivation is an urgent problem in the development of energy efficient mechanoactivation.

The objective of the work: The object of research is the patterns of formation of shock-abrasive loads in magnetic liquefied layer of electromagnetic mechanoactivation.

The material and methods of the investigation: Used experimental and statistical research methods.

Results of research and their discussion

Grinding process in grinder-mechanoactivated is simultaneously both random and static in nature [3]. By analogy with drum mills in a disk mechanoactivated randomness manifests itself in the collision of particles with the grinding elements, and the static – that the process involved an infinite number of particles and, thus, they are very diverse in their physical and mechanical properties. It is also assumed that the grain particles have a spherical shape.

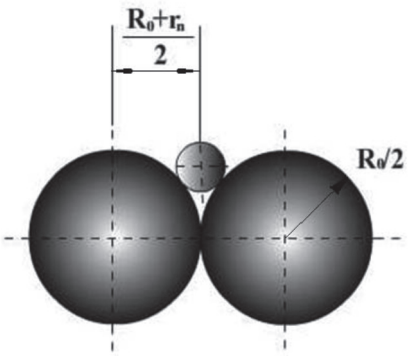

Fig. 1. Area of collision of the balls

Thus, the probable number of particles in the impact area of the grinding balls:

$$N_{VER} = 4,5\left(\frac{R_0}{r_n}\right)^{0,5}(1-e^{-0,5V}), \qquad (1)$$

where $(1-e^{-0.5V})$ – a function of the probability of finding the particles in an impact zone;
V – share fill grinder-mechanoactivated material.

In the process some particles are pressed into the surface of the grinding elements, the other pulled from the surface by their relative motion. Therefore, making the assumption that the grain size is at equilibrium these two processes, the formula for the probable number that came under attack, has the form:

$$N_e = 2{,}15\left(\frac{K_1}{K_2}\right)^{\frac{1}{3}}\left(\frac{R_0}{r_n}\right)^{1{,}5}(1-e^{-0{,}5V})^{\frac{1}{3}}\left(\frac{e^{-0{,}7H}}{1-2{,}5He^{-H}}\right)^{\frac{1}{3}}, \quad (2)$$

where – $1-2{,}5He^{-H}$ the probability of detachment of particles pressed in contact with a particle in another bowl (this function has a definite view): very large and very small N the probability of separation is very high;at intermediate hardness, the probability will be minimal (in $H = 1$ the function has a minimum value 0,08).

$P_e = e^{-KH} = e^{-0{,}7H}$ – the probability function of the indentor particles in the grinding element at impact; H – the ratio of hardness of the particle (coefficient $k = 0{,}7$ is determined from the condition that $H = 1$, function Re = 0,5 equiprobable).

From the equation it is seen that the number of particles Ne is relatively insensitive to changes in probability coefficients $k1/k2$, for this reason, they can be neglected in further calculations.

Based on the foregoing, L.F. Bilenko displays the formula [2], allowing to determine the speed of the grind product in a drum mill with ball loading (the rate of grinding proportionally the number of particles in the impact zone, the probability of fragmentation particles in the zone at least once, the factor limiting the freedom of movement of the grinding elements, when the material in the mill lot):

$$\frac{dG_1}{dt} = k_3\left(\frac{R_0}{r_n}\right)^{0.5}\left(1-e^{-0.5V}\right)\left\{\left[\frac{Nb^2}{A}\right]^2+\left(1-\left[\frac{Nb^2}{A}\right]^2\right)\left[1-e^{-0.7H}\right]\right\}\left(e^{-k_4 N_{VER}}\right)I_P V_M \frac{e^{-0.1V^2}}{d^3}, \quad (3)$$

where G_1 – the amount of product per stroke, which can be presented to the newly formed surface;

$(Nb^2/A)^2$ – the probability of the opposite event;

$1-e^{-0.7H}$ – the probability of introducing particles to the grinding element at impact.

The product of these last two functions gives the probability that the particle will be sandwiched between clean surfaces and will not stick to the grinding element (i.e. for soft particles).

Function $(Nb^2/A)^2 + 1 - (Nb^2/A)^2\,(1 - e^{-0{,}7H})$ determines the probability of holding a single particle between any type of surfaces (the probability of occurrence of one of two incompatible events is the sum of their probabilities). And since the hardness of the steel grinding elements, a lot more the hardness of the grains, N >> 1, then the function will take the value equal to one.

Function: $\left(e^{-k_4 N_{VER}}\right)$ – determines the probability of crushing particles in the impact zone (and, if you increase the number of particles in the cell it is reduced).

The expression $I_p W_M / R_0^3$ – determines the number of grinding elements of the disposer – mechanoactivated (where I_p – the proportion of filling of the chamber the grinding elements, and W_M – the volume of the chamber chopper).

Function $e^{-0.1V^2}$ there is a possibility of restriction of freedom of movement of the grinding elements in the presence of the material.

Given these provisions, the formula (3) with regard to the material component of the feed can be simplified:

$$\frac{dG_1}{dt} = k_3\, r_n^{-0.5}\, R_0^{-2.5}\left(1-e^{-0.5V}\right)\left(e^{-k_4 N_P}\right)I_P\, W_M\, e^{-0.1V^2}. \quad (4)$$

Making the assumption that each hit generates the same increase of surface, the formula (3) describing the amount of milled grain product can be brought to mind, characterizing the increase of the surface S_1.

If $S_1 = kG_1$ (или $dS_1 = kdG_1$), the increase in surface occurring in a single blow:

$$\frac{dS_1}{dt} = k_5\, r_n^{-0.5} R_0^{-2.5}\left(1=e^{-0.5V}\right)\left(e^{-k_4 N_P}\right)I_P\, W_M\, e^{-0.1V^2}. \quad (5)$$

High-speed shredding will be observed for the solid material when filling the space between the grinding elements is approximately $\frac{1}{10}$, for soft-about half. Moreover, with decreasing particle size, the probability of their falling into the grinding zone will be reduced, and therefore, is preferred grinding larger particles.

The fundamental theory underlying the mathematical modeling of the magnitude of the force of contact between the ferromagnetic elements in the phases of working process (formation, destruction of structure groups of ferroaluminum, the formation of "layer sliding") based on the development of the dipole model Maxwell [4–6]. Examining and setting the quantitative parameters of the energy process occurring with one structural group of Ferrochrom, and multiplying the result by the number of structural groups in the amount of handling of the product, you can determine the energy of the working process of the formation of dispersive loads in EMMA. When calculating the number of chains of ferromagnetic grinding elements is determined by the expression $n_{sp} = Entier\left(N_{sp}\frac{d}{h_0}\right)$ (here N_{sp} – the number of grinding elements spherical shape in the working volume EMMA; d – the diameter of the grinding element; h_0 – distance from stator to rotor). When developing the linear theory makes the following assumptions: power Fr and moments Mv, acting on the magnetized grinding element in the working volume EMMA, determined on the basis of the dipole models Maxwell's; the diameters of the grinding elements is less than the width of the working volume ($d << h_0$) and a lot more particles of the processed material ($d >> r_f$); structural groups of grinding elements until the moment of their destruction when the critical angle of the structural groups of Ferrochrom v_{cr} the transition in the phase of formation "layer slip" is not interact.

Taking into account the original size of the particles r_f, power Fr and moments Mv, acting on the grinding element of radius R_0 in a magnetic field with a strength H in the working volume EMMA, determined by the equalities [6, 7]:

$$Fr = \frac{1}{2}\frac{\mu-1}{\mu+2}R_0^3\frac{\partial H^2}{\partial r}\Big|_{r=2R+r_f}, \quad (6)$$

$$M\nu = \frac{1}{2}\frac{\mu-1}{\mu+2}R_0^3\frac{\partial H^2}{\partial \nu}\Big|_{r=2R+r_f}. \quad (7)$$

Critical angle v_{cr}, in which the attraction of the balls is replaced by their repulsion, is defined by the formula:

$$\nu_{cr} = \frac{1}{2}\arccos\frac{11+13\mu}{9(5+3\mu)} \approx \frac{1}{2}\arccos\frac{13}{27} \approx \frac{\pi}{6}. \quad (8)$$

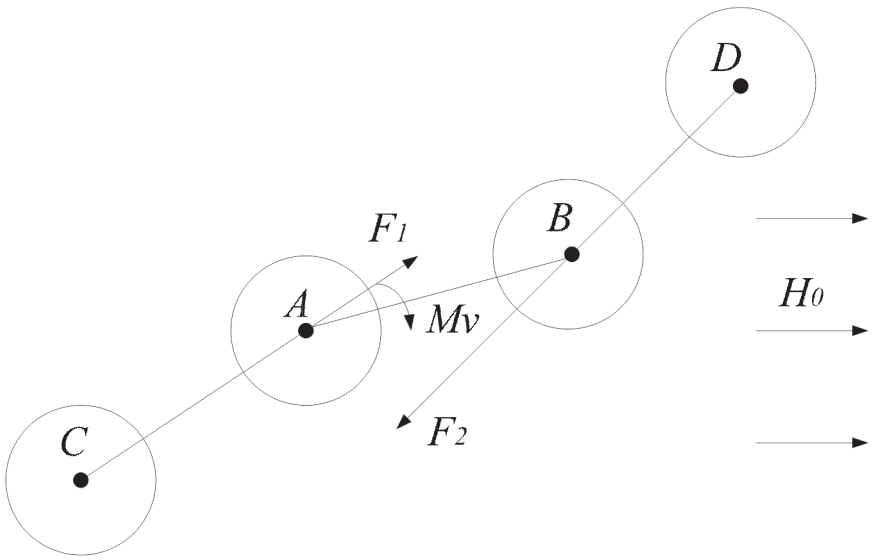

Fig. 2. Deformation of structural groups of grinding elements in EMMA

The equilibrium structural group

In areas of AB, DF, etc. the tilt changes from 0 до v_{cr}. Therefore, in these areas the force of attraction of the balls also changes. For simplicity, the compressive forces in these areas takes some average force acting on these sites and corresponding to the angle value v_{cr}:

$$F_r = H_0^2 R_0^2 \frac{(\mu-1)^2}{(\mu+2)^3}[-0,43(\mu+1,37)+\frac{r_f}{R_0}(\mu+1)]. \quad (9)$$

Corresponding to this force, work is defined by the formula:

$$A_2 = H_0^2 R_0^2 \frac{(\mu-1)^2}{(\mu+2)^3}\frac{N_{sp}}{2}[0,43(\mu+1,37)(r_{f1}-r_{f2})-\frac{1}{2R_0}(\mu+1)(r_{f1}^2-r_{f2}^2)]. \quad (10)$$

Thus, the work expended on the crushed product from the initial grain size r_{f1} to a final size r_{f2} static grip between the balls equal to: $A_{cmp} = A_1 + A_2$. The destruction of the structural groups of Ferrochrom all spent working on changing the angle v to kinetic energy, which is consumed on impact of destruction of the product. The rotation of the object AB, DF, etc. at the expense attached to them moment Mv, which is calculated according to the formula (4). This formula can be neglected with respect to r_f/R_0 compared to the unit:

$$M(v) = F(\nu)\ 2\ R_0 \sin \nu - M_v(\nu). \quad (11)$$

The work done to turn N_{ob} / 2 objects of type AV on the angle from 0 to π/6 defined by the equality:

$$A_u = \frac{N_{ob}}{2}\int_0^{\pi/6} |M(\nu)| d\nu. \quad (12)$$

The final formula for the calculation of work impact fracture of the product is as follows:

$$A_u = N_{ob} H_0^2 R_0^3 \frac{(\mu-1)^2(0,002\mu-0,02)}{(\mu+2)^3}. \quad (13)$$

In the process of mA change energy and technological properties of finely dispersed material, which are determined by the level of the average W^V and local $W^{\Delta V}$ energy density achieved in the activation process. The stored energy is released with the formation of new surface ΔS. Option $\Delta S/V$ (ΔS – the growth surface by grinding the sample volume V) depends on the energy properties of the material, manifested in the values of the surface energy W_P, Efficiency dispersion η_D, average W^V (in the sample) and local $W^{\Delta V}$ (in the centers of destruction) the energy density at failure:

$$\Delta S/V \approx (W^V \eta_D) / W_P \text{ or}$$

$$\Delta S/V \approx (W^{\Delta V} \varepsilon\ V \eta_D) / W_P. \quad (14)$$

Assuming that the externally supplied energy is concentrated in the deformation process the structural defects, and in the act of dispersion is converted to erection work structural grains, the evaluation of specific energy consumption for the mechanical activation of the value of local elastic energy density in the foci of destruction (zones of dispersion) and can be defined by the formula:

$$W^{\Delta V} = W^V/\varepsilon_i = \sigma_0\ \varepsilon_0/2\varepsilon_i, \quad (15)$$

where σ_0, ε_0 – tensile strength and strain at tensile strength; ε_i – deformation at the stage of dispersion.

The calculation used the software package "ANSYS" to determine the intensity of an electromagnetic field in a given system contact points of the "ball – particle – ball" working volume EMMA any structural modification and determine on the basis of the decision of problems of elastic solids the specific activation energy necessary and sufficient for obtaining stable and predictable properties of activated materials for various purposes [7–9].

Conclusion

Physico-mathematical modeling of the process of the formation of dispersive shock-abrasive loads between the grinding ferroaluminum in structural groups through the layer of the processed material and analysis of the models improves energy efficiency design EMMA for various purposes.

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METHODS AND MEANS OF INFORMATION SECURITY IN TELECOMMUNICATION SYSTEMS

Mahambaeva I.U., Dautbaeva F.Zh.
Korkyt Ata Kyzylorda State University, Kyzylorda, e-mail: fary_95@mail.ru

The recent progressive impact of information technology on almost all spheres of human activity causes the progressive growth of the requirements for telecommunications systems and telecommunications devices. This is due to the fact that these systems are so far the primary means of information exchange and the quality of their operation is the determining factor in the effectiveness of most of information technology. The most important component of the quality of functioning of telecommunication systems is the quality of information security. Provision of this component is currently facing a number of problems, the main one being the contradiction between the potential of the existing approaches and constantly increasing requirements for data protection. The potential failure of these approaches to fulfill changing requirements explains the relevance of the search direction of research fundamentally new approaches that allow solving the mentioned problems.

Cryptographic methods of information protection – is a powerful weapon in the struggle for information security.

Cryptography is a set of data conversion methods, aimed at making the data useless to the attacker. Such transformations can solve two major issues relating to information security:

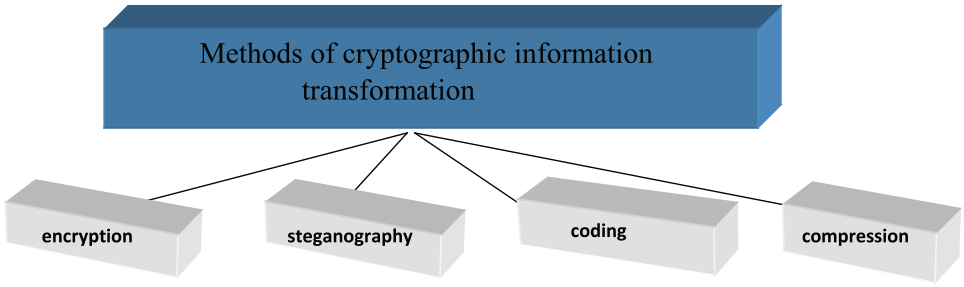
- Protection of privacy;
- Integrity protection.

Problems of protection of confidentiality and integrity of information are closely linked, so the methods of solving one of them is often applicable to other solutions.

There are different approaches to the classification of cryptographic information transformation methods. By referring to the initial exposure information, cryptographic information conversion methods can be divided into four groups.

The encryption process is to conduct a reversible mathematical, logical, combinatorial and other transformations of the initial information, as a result of which the encrypted information is a chaotic set of letters, numbers and other characters and binary codes.For the encryption algorithm used information. Typically, the encryption algorithm for a particular method is unchanged. Initial data for the encryption algorithm is the information subject to encryption and encryption key. The key contains control information that determines the choice of conversion at certain steps of the algorithm and the size of the operands used in the implementation of the encryption algorithm. Operand – a constant, variable, function, expression, and other object programming language on which operations are performed. Unlike other methods of cryptographic transformation of information, methods of steganography can hide not only the meaning of stored or transmitted data, but also the fact of storing or transmitting classified information. The basis of all methods of steganography is the masking of sensitive information among open files, i.e. hiding secret data, thus it is realistic figures that are impossible to distinguish from the real thing. Handling multimedia files in information systems has opened almost unlimited opportunities for steganography.

The graphics and audio information presented in numerical form. Thus, the graphic objects in the smallest picture element can be encoded in one byte. The lower level of certain bytes of the image according to the algorithm cryptographic transformation placed bits hidden file. If you choose the right algorithm for image transformation and against which is placed a hidden file, the human eye is almost impossible to distinguish from the original image is obtained. With steganography, tools may be masked by the text, image, voice, digital signature, the encrypted message.



Classification of cryptographic information transformation methods

Hidden file can also be encrypted. If someone accidentally discovers a hidden file, the encrypted information is perceived as a failure of the system. Integrated use of steganography and encryption greatly increases the complexity of solving the problem of detection and disclosure of confidential information.

The content of the process of encoding information is the replacement of the original meaning of the message (words, sentences) codes. The codes can be used as a combination of letters, numbers, punctuation, special tables or dictionaries are used when encoding and reverse transformation. The information networks encoding of the original message (or signal) software and hardware used to improve the reliability of the transmitted information.

Often, encoding and encryption mistaken for the same thing, forgetting that to recover the encoded message, enough to know the replacement rule, while to decrypt the message encryption in addition to knowledge of the rules, it requires a key to the cipher.

Data compression can be attributed to the methods of cryptographic transformation of information with certain reservations. The aim of compression is to reduce the amount of information. At the same time, the compressed data cannot be read or used without inversion. Given the availability of means of compression and inversion, these methods can not be considered as a reliable means of cryptographic information transformation. Even if kept secret algorithms, they can be relatively easily opened by statistical processing methods. Therefore, the compressed files of confidential information are subject to subsequent encryption. To reduce the data transmission time is expedient to combine the compression and encryption process information.

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The work is submitted to the International Scientific Conference "Modern high technologies", Israel (tel Aviv), 20–27 Feb 2017, came to the editorial office on 05.04.2017.

TECHNOLOGY OF FORMATION OF THE EXTERNAL SAILING WITH THE ADVANCING EMBANKMENT AND ACTIONS FOR PREVENTIVE MAINTENANCE OF IGNITIONS OF COAL

Tsygankov D.A.

N.A. Chinacal Institute of Mining, Siberian Branch, Russian Academy of Sciences, Novosibirsk, e-mail: gallantminer@gmail.com

Prevention of coal ignition in sailings of mining enterprises has obtained a special significance in terms of strict requirements towards ecological condition of natural environment [1]. The most efficient method of avoiding fires is implementation of mining technologies that imply preventive measures against coal ignition.

The object of this research is prospecting area of a cut that carries out coal mining in conditions of sharply continental climate, defined by significant oscillation of temperature, cold and continuous winter and short, but hot summer. Snow surface preserves during five to six months. The prevailing direction of wind – West and South-West with average speed of 4,4 m/s. These aspects are considered while locating external sailings of mining enterprise and construction of dwellings [2].

The coal is presented by layers that are located in parallel at different depths and characterized by a complicated composition and low solidity. Moist content varies from 1,03 to 2,1%, actual solidity equals 1,47 t/m^3, coefficient of solidity equals 0,6-2,33, and angles of fallout – 5-80º. Quick oxidation and further ignition is typical for coal. Metane content grows along with depth of layer location and varies from 3-3,5 m^3/t to 7,5-8,2 m^3/t [2].

Uncovering and storing rocks are presented by clays, clay loam, sandstone, argillites, and aleurolites [2].

Technology of mining at a site implies facilitation of one internal and two external sailings. Transportation of uncovering rock is carried out by trucks, and their pushing and planning of sailing surface in the area of unloading – by bulldozers.

In order to improve stability of external sailing board during formation of lower level that falls down along thalweg of ravine, it is necessary to implement technological scheme of sailing formation that implies directing front of mining operations. This front must be located in perpendicular to axis of ravine thalweg, and dumping must go along its direction.

Front of dumping works is divided into three sectors. First of all, dump goes along water divisions and ravine slopes – lateral areas, characterized by lower altitude. The central area, located along ravine thalweg and defined by the greatest altitude, is dumped last. The central area of sailing is dumped with more solid rocks (sandstone, argillites, and aleurolites), and laters areas – with less solid types (clays and clay loam). No more than two sites can operate, the third site is reserved for stabilization of the emerging tension.

Formation of sailing along ravine thalweg is carried out with preliminary dump of leading embankment that is located at the same axis as the lover border of sailing. At the same time stability of the lower level in the formed sailing is regulated by height and depth of the leading embankment. Width of the leading embankment is defined via method of its construction and parameters of the aggregate that forms dumping, leading degree is defined according to width of foundation riser prism that, in its turn, is defined according to power of the weak layer. Maximum height of external sailing levels must not exceed 20 m.

Table 1

Characteristics of measures on preventing coal ignition

Parameter	Units	Value
Fire-safe thickness of non-isolated layer of sailing rock mass that contains coal	m	0,75
Degree of densifying coal-containing sailing rock mass that secures fire safety of sailing	–	0,7
Thickness of the isolating cover, composed of inert rock	m	0,35

Table 2

Set of equipment, required to reveal ignition centers

Measurement tool	Range of evaluated temperature, °C	Standard error, ±°C	Purpose
Thermal camera	from 20-40 to 1500-2000	0,1	Measuring temperature according to thermal radiation
Pyrometer	from 20-30 to 900-1200	2%	Contactless temperature measurement
Thermometer	from 0-600 to 30-30000	0,5-1,0	Thermometer with protective box for contact temperature measurement
Thermal-electrical transformer	from -40 to 1000	0,15-0,5%	Measurement and indication of temperature in complete set with thermal pairs

In order to prevent spread of open fire centers around stocks of broken coal and coal dust isolation of layers, operation sites, and the prospected area with inert rock is implemented. Thickness of the inert layer, composed of clay and clay loam equals 0,35m and is a subject of densification. Laying of rock mass that contains coal, into sailing is carried out in layers around the whole area of storage. Rock mass, carrying coal is planned with bulldozers with formation of layers 0,75 m thick. Along with laying each layer is densified with trucks up to degree of 0,7 and moisturized with water (table 1).

Fire-safe thickness of non-isolated layer of sailing mass H is defined according to formula [3]:

$$H = \sqrt{\frac{1,26 \cdot 10^{-8} \cdot \gamma \cdot (T_1 - T_2)}{V}}, \quad (1)$$

while γ is thermal conduction of sailing mass; T_1 is critical temperature of sailing mass heat; T_2 is average temperature of the warmest month of the year; V is speed of oxygen sorption in sailing mass.

Degree of sailing mass densification that secures fire safety of sailing e is defined according to the formula [4]:

$$e = 1 - \sqrt[4]{\frac{173,76 \cdot k_1}{d^2}}, \quad (2)$$

while k_1 is coefficient of sailing mass air permeability; d is equivalent diameter of sailing mass pieces.

Thickness of the isolating cover B is defined according to the formula [4]:

$$B = \frac{\left(\frac{k_0}{k_1} - 1\right) \cdot l - \left(\frac{k_0}{k_2} - 1\right) \cdot b}{\frac{k_0}{k_3} - 1}, \quad (3)$$

while

$$b = \frac{\left(\frac{k_0}{k_1} - 1\right) \cdot l}{\frac{k_0}{k_2} - 1}, \quad (4)$$

while k_0 is coefficient of air permeability in sailing mass in the area of heat; k_2 is coefficient of air permeability in densified sailing mass; k_3 is coefficient of air permeability in isolating material; l is width of heating area in sailing mass; b is thickness of densified sailing mass layer.

Significant advantage in revelation of fire centers among rock sailings at early stages of ignition can be achieved with instrumental control of their thermal condition. Early signs of coal-bearing rock heating as well as opportune measures of preventing fire spread are rarely taken according to the results of visual observation. Possibilities of observing rock sailing areas with revelation of ignition centers and burning areas are provided by equipment, described in table 2 [5].

Temperature filming must take place on regular basis at current not-burning as well as burning not operational sailings several times a year – in spring and autumn. At sailing territories, temperature of which exceeds temperature of other mining sited by more than 5 °C or value of 45 °C, measures of its decrease must be taken [5].

Conclusion

1. In order to improve board stability it is necessary to implement technology of forming external sailings that implies change in mining operation front and dump of leading embarkment.

2. Prevention of coal ignition in external sailings requires isolation of layers, operation sites, and the prospected area with inert rock.

3. Technology of forming external sailings with leading embarkment and measures of ignition prevention must include formation of underlying layer from inert rock, planned with bulldozers and densified with trucks; further placement and planning of coal-bearing rock with bulldozers truck densification and moisturizing with water; formation of covering layer from inert rock with bulldozers in collaboration with trucks, etc.

4. Practice of heat control over rock sailings must include instrumental means of locating coal ignition threats, as visual observation often provides insufficient or unreliable information on source and area of fire.

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The work is submitted to the International Scientific Conference "New technologies, innovation, invention", Israel (tel Aviv), 29 April to 6 may 2017, came to the editorial office on 21.02.2017.

Short Reports

CULTURAL SENSE OF A COSTUME "MEMORY" IN TAILORING OF MORDOVIAN SHIRT

Shigurova T.A.

Federal State Budget Education Institution of Higher Education Scientific-research institution "Mordovian state university of N.P. Ogarev", Saransk, e-mail: dep-general@adm.mrsu.ru

Urgency of problem, related to interpreting cultural sense of Erzi and Mokshi traditional costume is defined by unresolved question in the area of Mordovian culture genesis. In research of this problem system and informational-semiotic approach play the main part. Difference in tailoring basic element of shoulder clothes of Mordva, Mokshi, and Erzi ubderlines genetic variety of the formed culture and binary nature of Mordovian ethnos.

While studying traditional clothing it is impossible to neglect special features of its tailoring – one of basic signs in specificity of material and spiritual culture of an ethnos. Traditional Mordovian costume is the most complicated phenomenon of culture that counts about 16 local variants that correspond to subethnical difference of nation. Tailoring of Mordovian clothing attracted attention of such scientists as N.I. Gagen-Torn, B.A. Kuftin, K.I. Kozlova, V.L. Sychev, O.A. Sukhareva, N.P. Lobacheva, and others [1–6]. Studying semantic of the costume leads us to comprehending it as a certain language of ethnoculture, special sign system of transferring meanings that exceed limits of usual concept [7, 8, 10].

Difference in tailoring shirt, a basic element of Moksha and Erzi complex of clothing, touches upon the foundation of Mordovian culture. Erzyan shirt differs not only from Moksha type, but also from shirts of other By-Volga nations in principles of forming collar, sleeves, hem: two panels of linen, bent across and tailored between each other, formed the foundation of shirt with four stiches, placed in the middle of chest and back, and two – on its sides. The shirt had unsewn gap (approximately 30 cm) that formed cone-shaped cut. The origin of Erzyan tailoring is related to population of agricultural type, and this fact reflects semantic of labour activity [4, p. 9]. Tailoring of Mokshan shirt, made of 4 linen plates with locating a whole plate in the middle of chest and back and making a whole for head in place of connection between two cloths refers to the second subtype of Volzhskiy-Finnish tunic-like type that is also typical for Mariya, Chuvash, Udmurtian shirts as well as shirts, worn by women in Southern-Russian districts of Tula, Ryazan, Penza, Oryol, Tambov, and Voronezh regions. The prototype of such tailoring is unopen clothing, made of thick felt with a cut for head, that remains one of basic clothing element in Arab world [1, p. 10]. Mokshan type of tailoring demonstrates relation between culture of Mordva-Mokshi and ancient traditions of steppe nomad world [8, p. 137-138]. It can be considered as a materialized sign of cultural community of Middle By-Volga nations – Finno-Ugric, Turk, and Slavyan.

Thus, tailoring of a clothing element is a sign that broadcasts multidimensional information on past and present in culture of an ethnos, underlines genetic variety of the formed culture. Participation of tribes that inhabited neighboring territories, as well as foreign-ethnos elements in initialstage of formatting an ethnos culture is obvious. This fact demonstrates complex and multidimensional nature of Mordovian culture that finds a vivid display in *binary character* of Mordovian ethnos. The most valuable, from the position of society, fragments of memory are preserved in ritual [9, p. 135–139; 11, p. 117–122].

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Short Reports

STATE CO-OPERATING WITH THE INTERNATIONAL CRIMINAL COURT

Gracheva R.O.

Kursk State Medical University, Kursk, e-mail: kopcevarada@mail.ru

The short message opened the question about state co-operation with the International criminal court. There are numerous political, legal aspects and difficulties with state co-operating with the International criminal court.

"According to article 5 of the Statute of ICC the court jurisdiction "is limited to the most non-capital offenses causing concern of all international community". Treat them: genocide crime; crimes against humanity; war crimes; aggression crime. The last isn't covered now by ICC jurisdiction as the international agreement containing determination of this crime and determining criteria by which ICC shall be guided in case of implementation of jurisdiction concerning this crime isn't developed yet. It is known that the concept of aggression is determined at the level of the General Assembly resolution of December 14, 1974, but it concerns actions of the states, but not individuals and, therefore, isn't suitable for a situation of consideration of criminal cases in the ICC.

As for genocide crimes, already 133 states, including all permanent members of the UN Security Council, ratified the Convention on warning of a crime of genocide and punishment 1948 for it. First of all serious violations of four Geneva conventions on protection of the victims of war of August 12, 1949 belong to war crimes. By the present moment these conventions ratified all member states of the UN. The additional protocol to the Geneva conventions of 1949 concerning protection of the victims of the international armed conflicts (Protocol I) was ratified by 167 states, and the Additional protocol II – 163 states.

Any of the following acts which are made within large-scale or systematic conscious attack on any civilians belong to crimes against humanity: murder, destruction, deportation, tortures, enforced disappearance of people and so on. These acts are forbidden by the corresponding international conventions, for example, the Convention against tortures and other cruel, inhuman or degrading treatment or punishment of December 10, 1984, the International convention for protection of all persons against enforced disappearances of 2006 and others.

On the basis of all these existing conventions the State Parties undertake obligations to pursue the persons which committed the international crimes, but at the same time many of such states can't be determined with recognition of jurisdiction of ICC which is created as one of effective remedies of legal prosecution and punishment of the persons which committed the most serious international crimes. Besides he acts only when the relevant states aren't able to pursue the persons which committed such crimes on the basis of the national criminal justice system or don't do it properly [1].

If to take for an example the Convention on the prevention of a crime of genocide and punishment for it, then the states agreed that genocide irrespective of, this crime in peace is committed or wartime, is a crime which breaks rules of international law and against which state undertake to apply measures of prevention and to punish for its making. Already more than half a century from the moment of adoption of this Convention there is an unambiguous understanding that genocide where it occurred creates threat of the international security and the attitude towards him shall be intolerant. Such line item of the states should be considered first of all from line items of a new type of the international liabilities which are already acknowledged in the international legal doctrine and practice of UN International court. It is about liabilities of "erga omnes" ("between all").

The UN international court confirmed existence of distinctions between liabilities of the states concerning each other and the liabilities concerning the international community in general following from such regulations as prohibition of aggression, genocide and also from regulations about protection of fundamental human rights. Owing to the nature these liabilities "are care for all states. Taking into account value of the appropriate rights all states can be considered having legal interest in their protection" [2].

In "Responsibility clauses of the states for international and illegal acts" the special head where it is said that "the states shall cooperate lawful means to put an end to any severe violation of" liabilities of this sort" is devoted to violations of such liabilities.

"For accomplishment of the liabilities (further – the Statute of ICC) the State Parties need to determine by the Rome Statute of the International Criminal Court whether it is required to adopt special regulatory legal acts about a cooperation with the International Criminal Court (further – ICC) and whether it is worth making changes to the national legal system. At the same time various approaches of the states to cooperation with the international judicial authorities are possible.

The first approach doesn't assume acceptance of special regulatory legal acts about cooperation in this connection action of separate regulatory legal acts of the state without entering into them

of any amendments extends to certain spheres of cooperation with the international judicial authority.

The second approach is based on a regulation of the main issues of cooperation in one or several regulatory legal acts and distribution on other types of a cooperation of other regulatory legal acts without entering into them of any amendments.

The third approach assumes acceptance of one or several regulatory legal acts which are in details regulating cooperation points of order, and introduction of necessary amendments to other regulatory legal acts" [3].

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