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Section 1. Study of art

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The role of holidays, traditions and art museum in learning karakalpak ethnography

Abstract: Karakalpak nation has its own traditions which is different from other nation. In this article said about karakalpak holidays, traditions and art museum. It museum exhibit in learning karakalpak ethnography.

Keywords: National holidays, Ramadan Khait, Kurban Khait Navruz, Savitsky, Zoroastrian, Zhdanko, Avesta.

Every year Karakalpakstan celebrates different public holidays: 1st of January — New Year, 8th of March — International Women's Day, 21st of March — Navruz, 9th of May — Memorial Day, 1st of September — Independence Day, 1st of October — Teacher's Day. Also we celebrate two major Muslim holidays in Karakalpakstan. Ramadan Khait and Kurban Khait, are days off and are celebrated each year according to the lunar calendar. Kurban Khait holiday is celebrated after 70 days from Ramadan Khait. [1, 35, 99, 131].

Holidays in Karakalpakstan have own history and its particular significance. Such holidays as Navruz, Eid-Al-Fitr and Eid-Al-Adha came from the ancient times, from Zoroastrianism and Islam traditions. Our people also widely celebrate international holidays: New Year, the most favorite and magic holiday around the world, and the International Women's Day, devoted to wives, mothers, daughters and all beautiful women of the Earth.

Navruz is also one of the ancient traditional holidays which have been celebrated for centuries by the nations in Central Asia and Near East. Historical manuals show that it has been celebrated as a large holiday since the reign of Ah-moniys The nations of Central Asia considered that the first day of the year began on the 21 of March and the holiday was held on this day. Passing many centuries, the custom of celebrating the holiday changed according to the lifestyle of the nations. People presented sweets to each other's during the holiday. Sweets were considered the symbol of life and people. That's why in weddings and other ceremonies sweets were sent or given reciprocally.

In former times on the first day of Navruz children divided in to some groups and sang the song devoted to Navruz at the gates of houses. The owners congratulated them with the holiday and gave different gifts or foods them. Some part of gathered food were taken to poor people in the village [2, 94–100].

The 9th of May in Karakalpakstan is the Day of Memory. We memorize our ancestors who died in the past [1, 96–101].

The 1st of September, the Independence Day is the celebration of Independence of Uzbekistan. We celebrate this holiday widely every year.



Karakalpaks sewed yurts on Navruz holiday

The 1st of October, the Teacher's Day is the celebration of respect of labor and wise patience of those, who put much efforts and precious knowledge to us. In fact, respect for a teacher has much deeper roots in our country.

The Karakalpak Art Museum (officially known as the Karakalpakstan State Museum of Art named after Igor Savitsky) contains the world's finest collection of Karakalpak material culture dating from the first quarter of the 20th century. There is its unique collections of exhibits, this "museum in the desert", as it is called by world well-known art experts, enjoys the public estimation far beyond the territory of Uzbekistan. But to see the vast collection which numbers nearly 90000 exhibits you should come to Nukus. The collection focuses primarily on women's wedding and other ceremonial costumes and on yurt tent bands, piled rugs, storage bags and other yurt decorations.

However, the museum's main claim to fame comes from its amazing collection of famous paintings rather than from its ethnographical materials. Both were collected by the museum's extraordinary and much-loved founder, Igor Savitsky.

Igor Vitalyevich Savitsky was born in Kiev in 1915. His father was a lawyer and his grandfather a professor of Slavic studies. In the early 1920s his family moved to Moscow and the young Savitsky was encouraged to draw and to paint, going on to study at the «1905 School of Art». He was later sent to work in the studio of a well-known local artist, who happened to be a friend of the Zhdanko family. In Karakalpakstan Savitsky worked as an illustrator for some seven years, attached to the Institute of Ethnography at the Academy of Sciences in Nukus, sketching and drawing the monuments and finds excavated by the archaeologists. It was during this period that he developed his interest in the ethnography of the Karakalpaks being studied by Zhdanko and her team. He started to collect local Karakalpak folk art, visiting towns and villages throughout the delta. As his enthusiasm for local Karakalpak culture developed he decided to abandon his flat in central Moscow and to go and live permanently in Nukus. Having familiarized himself with amazing history and ancient culture of Karakalpakstan he took a great interest in ethnography and archeology, and Karakalpakstan became his second homeland.

In time he had assembled thousands of items representing every aspect of Karakalpak folk art: costume, jewellery, carpets, yurt decorations, wood carvings, horse trappings and domestic utensils.

The Museum was opened in 1966 and initially its collection was exhibited in seven small rooms. It was only 20 years later that a special building was constructed to accommodate the Museum. Today the exposition of the Museum consists of three parts: department of ancient and medieval art, which represents ancient culture of Khorezm — a state once located on the territory of Karakalpakstan, [3, 76] the department of

folk applied arts, and the department of fine arts. The museum department of ancient and medieval art displays archeological findings which tell us about the history of ancient Khorezm — the homeland of “Avesta” and the trade links of local people with antique world, unique terracotta statuettes of Zoroastrian Goddess of fertility Anakhit, ossuaries — the containers for holding the bones of the dead relatives (fire-worshippers' tradition), various articles made of ceramic and bronze.



Karakalpak art museum

The foundation for the department of folk applied arts was the collection of items made by Karakalpak craftsmen. These items were collected during the expedition of Karakalpak branch of the Academy of sciences of Uzbekistan. Today the department of folk applied arts possesses a rich collection of national Karakalpak jewelry made of silver and cornelian, traditional hand-made carpets, embroidery and applique. The department of fine arts represents paintings and drawings collected by Igor Savitsky, art works donated to the Museum by noted artists of the country, and the paintings by Karakalpak artists.

At the present time this museum is our pride. The percentage of tourists who is coming to visit this museum is rising year by year. Nowadays there is building new two building which is part of this museum [3, 98].

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People's ideas of the covered dead as a sense-making factor of burial ritual in Ukraine. The past and the present

Abstract: The article deals with the people's ideas of “the covered dead” (a person who died but has not found peace after death) as a sense-making factor of elements of traditional and modern burial ritual in Ukraine. Analyzing

the development of the special way to bury “the covered dead” and historic conditions which influenced the transformation of the system of cultic and customary ceremonies, the deep meaningful links of modern Ukrainian ideas of death and after-death with the Old Slavic ones have been revealed.

Keywords: “the covered dead”, ideas of death and after-death, cultural permanence, burial rituals, Slavs.

Certain elements of Ukrainian burial rituals are rooted in Old Slavic cultural tradition and formed on the base of fundamental world-view ideas inherent to mythological thought. Historic conditions of the area of modern Ukrainian state, such as baptism of Kiev Rus in the 10th century, influence of atheistic ideology common in the 20th century, attempts to return to historic roots of the end of the 20th — the beginning of the 21st centuries, have changed immensely the form of burial rituals connected with burial and prayers for the dead, fundamentally preserving the layers of meanings corresponding to different world-view principles. The rudiments of these elements are still present in modern burial ritual, but they are unperceived. The most essential in this situation is understanding of both primary meanings of such elements and those acquired by them in the process of historical development. The importance of influence of “the covered dead” on formation of Old Slavic picture of the world and the fact that studying the idea of “the covered dead” as a sense-making factor of the elements of traditional and modern Ukrainian rituals is not enough, makes topical the proposed set of problems.

The burial ritual and prayers for the dead of the East Slavs have been studied by famous scientists, such as O. Sedakova [4], L. Vynogradova [2], V. Bilyi [1]; the fundamental research of “the covered dead” as a specific category of the dead was made by D. Zelenin [3]; the work of a well-known English ethnographer E. Tyler is devoted to the problems of deep links of the old times and the present [5]. Despite the marked interest to these themes, the problem of people's ideas of “the covered dead” as a sense-making factor of the elements of burial rituals has not been paid enough attention yet. On the basis of the above mentioned realities, the **aim** is: to consider the conception of “the covered dead” as a sense-making factor of the certain elements of traditional and modern burial ritual in Ukraine.

The object of the research is the people's ideas of “the covered dead”.

The subject of the research is the process of formation and transformation of the certain elements of Ukrainian burial rituals in the process of historical development.

Ukrainian national burial tradition largely inherits the Old Slavic tradition, where, along with the leading importance of the forefathers cult, the key factor in relation to the dead person was the type of his death, which is concretized in division into “natural” and “unnatural” [3, 39]. In case of natural death, that is, the death from natural factors like old age, the dead were treated with great respect and veneration, they were prayed for several times a year and called “parents”. Such dead acquired the status of clean ancestors, and, by popular notions, united with the great kin, i. e., all previous generations of the certain family. The burial ritual itself was perceived by

people's consciousness as a moment of transition, in which the change of a person's status is allotted with the help of the ritual. Rituals like washing the body and dressing it in clean clothes, burial train, weeping and lamentations, decent attire of graves, further prayers as the act of communication with the dead relatives, invitation “for a visit” on definite holidays, bringing food and necessary things, etc., were aimed at facilitation of transition to the Other world and paying respect to the dead as a new part of a great kin.

The second category of the dead are “the covered dead”, i. e. people who died accidentally or violently before the time of their natural death, often young, suicides, drunkards, witches, wizards, people cursed by their relatives, those who got missing, who died without a certain initiation or stillborns. Such dead were considered unclean, unworthy of respect and prayers, and often harmful and dangerous [3, 39–40]. According to the popular idea, due to the fact that they did not live the *age* given to them by their birth, i. e. the certain term of life, and did not acquire their *fate*, i. e. did not fulfill their life assignment, the transition to the next stage of being, which is logical for clean ancestors, is not made by unclean ones, and they “get stuck” in the world of living, not so rarely passing into the hands of “devilry”.

The term “the covered dead” seems a bit artificial, it was introduced in the scientific vocabulary by the famous ethnographer D. Zelenin, who wrote the fundamental work on this problem. In this connection he notes, “There is no general and popular name for those who died unnatural death. As a general rule people avoid giving precise and clear names to dangerous beings. Sometimes such dead are called with the word *corpse*, which is a contemptuous name for the dead” [3, 41]. The author borrows the very name of “the covered dead” from people who live in Vyatka, and its meaning is disclosed through the way of burying the dead which verges on it complete absence: “the covered dead” were not buried in the earth or in some other way, their bodies were dumped in the wastelands, in ravines, bogs, thick windfall bushes in the forests, and the body was covered with branches and stones. The taboo for burial of “the covered dead” in the ground was connected with the fear to defile the earth, which is a sacred space, by an unclean body. As people imagined, the Mother-Earth could respond with frosts and poor crops, which could cause famine. “The covered dead” were deprived of other honours, such as burial train, they were not lamented over, not prayed for, people did not bring them food. The following custom was exclusive: when the parents were invited during the Christmas holidays, the food for them was put under the table, because of the fear to infuriate “the covered dead”, as it was considered that they would come anyway, but were not allowed to sit at one table with the parents. There was also a way to pray for

“the covered dead” by putting branches on their graves, which also has something in common with the peculiarities of their burial, and scatter grains on the cross-road for free birds who symbolized the soul for the Slavs. As in the previous case, the motive to pray for “the covered dead” in this way was not the respect and the wish to honour the dead, but the fear of them. When the bodies were prepared for burial, much was purposefully done inversely, for example, the dead was carried headfirst, was turned three times on the cross-road not to remember the way home, etc. “The covered dead” was never carried across the sown field, and the grains, stored at home, had to be moved and turned so that they could “stay alive”.

Once the Christianity was established and the church started fighting with pagan cults, the so called “skudelnysya” or “a miserable house” began to appear, which was a big hole in the earth with a room for prayer above it, where “the covered dead” and the unknown bodies were collected and left uncovered up to the seventh Thursday after the Easter Day. Then the people “out of godfearing Christian sedulity” came to cover the hole and dig the new one, this action was often accompanied by commemoration with meals. As a Ukrainian ethnographer V. Bilyi says [1, 83], appearance of these “miserable houses” was a kind of a compromise between a people’s idea of not allowing to bury “the covered dead” and an ecclesiastic idea, according to whose dogmas a body must be buried in the earth, but without a funeral service or not on the church cemetery. Later “miserable houses” became something like children shelter, as children were abandoned there both dead and alive, and the keepers of these “miserable houses” took them for upbringing.

The reason for making “miserable houses” was not the wish to reach a compromise, but the cases when in drought or some other all-people disaster, people just dug out their dead and dumped them on the wastelands or bogs, or coated with water, because it was considered that “the covered dead drinks water from the earth and the sky”. The most recent cases were recorded in Dnepropetrovsk (then Katerynoslavsk), Kyiv and Kharkiv regions in the late nineteenth century [3, 100–109].

Modern burial ritual in Ukraine is performed in various ways considering the wish of the person who died, their family, their religion, etc. It is interesting that in burial ritual the elements still exist in definite forms whose sense-making factor is the ideas of “the covered dead” which, as a system of world-view beliefs, is completely unknown to most of our contemporaries. The famous English ethnographer E. Tyler, looking into the problem of the origin and development of religious beliefs and turning to the area of superstitions and survivals in traditional culture, wrote, “When a custom, an art, or an opinion is fairly started in the world, disturbing influences may long affect it so slightly that it may keep its course from generation to generation, as a stream once settled in its bed will flow on for ages. This is mere permanence of culture” [5, 63]. In modern Ukrainian burial ritual we can find two similar strongly pronounced elements — the custom to bury unmarried girls in a wedding dress, and the custom to wash

the floor after the dead has been taken out. Let us look into them separately.

The custom to bury unmarried girls in a wedding dress originates in special attitude to a person’s assignment in this world, moreover, the word “fate” is used here not in the sense of objective regularity, i. e. destiny, doom, but just in the sense of assignment, which is varied according to the sex, age, etc.: the child’s assignment is to respect the parent’s will, the girl’s — to marry and give life to children, a man’s — to defend his family, parents’ — to bring up their children and pass them traditional knowledge. In Ukrainian folklore we encounter such collocations as “a soldier’s fate”, “a woman’s fate”. The fate-assignment regulates social roles, relations, duties. A person living their life according to their gender, social, family assignment, *acquire their fate*. In the Old Age unmarried girls were not just buried in the wedding dress, but there were also future husbands chosen for them, the best men appointed, their heads were decorated with wedding chaplet, the wedding cake was baked. The girl, who did not create her own family and did not continue the kin, could find herself outside the kin, and, by people’s imagination, could turn into a mermaid, forest dryad or some other devilry. “Marrying off” the girl in this way her parents tried to help her avoid such a fate. Today this custom has acquired a new meaning, for example, it is considered, that every girl dreams of getting married, and thus, they make her last wish come true, or, if a girl is not married, she becomes a Christ’s bride, and she must appear in front of her groom in a proper manner.

The custom to wash the floor after the coffin has been taken out of the house, the floor being washed thoroughly, starting from the far corner, has been preserved until now. It is considered that this water must not be left at home, or pour out in the yard, or used for household needs. The water, that was used to wash the floor, must be taken away to the cross-road and poured out there. This custom is rooted in the idea that water is an irresistible barrier for the soul. Thus, washing the floor is an attempt to prevent the soul from returning to the house, to protect the space of life from intrusion of the space of death. It should also be noted that the floor is washed not only after “the covered dead” died, but after any death.

Now both these customs are fulfilled according to the wish, the first is more common than the second one. The water, after the floor has been washed, is also seldom taken to the cross-roads. It should be mentioned that in the countryside these customs are more observed than in the cities.

So, people’s ideas of “the covered dead” belong to the complex system of world-view concepts and originate in Old Slavic cultural tradition. Along with the cosmogonical myth, they are a sense-making factor of certain elements of national burial culture which has kept the remains of pagan world view, rudiments, that still exist, that are performed unconsciously, or, in general, acquire new or additional meanings in the process of transformation of people’s idea. In modern Ukrainian burial ritual such elements can include the custom to bury unmarried girls in the wedding dress and the custom to wash the

floor after the coffin has been taken out of the house. In first case, the motive is the attempt to help the girl avoid the fate of “the covered dead”, in the second — to protect the living space and people who live there from destructive influence of death, which “the covered dead” impersonates. Understanding of primary meanings, which were put into these customs in

times of pagan world view, help us indicate deep continuity and permanence of the Old Slavic culture by Ukrainian one, it lays a certain ground for further study of influence of the Old Slavic traditions on modern ideas of death and after-death in the Ukrainian society.

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Semiotics and manuscript heritage of Ukraine and Greece

Abstract: The article presents innovative studies of the Slavic Cyrillic manuscript fund by way of semiotics. It refers to both traditional and polysemiotic language methods, when semiography and semiotics are combined, as well as ethnosemiotic methods of research. Special emphasis is put on the uncovering of chironomic system by way of semiotics.

Keywords: semiotics, polysemiotics, semiography, ethnosemiotics, semiosis, chironomy, Slavic Cyrillic manuscripts.

Speaking about the problems of parallelism and peculiarities of development of the spiritual culture of Ukraine and Greece in particular, and the spiritual culture of Slavs and Greeks in the whole, sooner or later the scientific world will refer to the manuscript heritage of the mentioned nations. As it was repeatedly mentioned in previous works, a manuscript is a genetic code of a nation, with the help of which one can give answers to many questions that attract interest of modern science.

With evolving scientific thought and innovation of studies, new methods and forms of research appear in scientific usage. These innovations also refer to the manuscript heritage. We will speak about semiotics that is closely related to the manuscripts, not only in the narrow language sense, but in the wide sense of a research of the manuscript heritage. Consequently, the topic of the present study is current and scientifically reasonable.

The object of the present research is the manuscript heritage of Ukraine and Greece.

The subject of the research is semiotics as a method of research of the manuscript fund of two countries.

The goal of the work is a wide introduction of new principles of research of the manuscript heritage of Ukraine and Greece by way of semiotics in the scientific usage.

In accordance with the above set goal of the research, the following tasks are formed:

- to explain how one can study Slavic (Ukrainian) and Greek manuscripts with the help of semiotics;
- to understand the structure of semiotic principles of research of the manuscript heritage of Ukraine and Greece;
- to show in practice the effect of semiotic principles with regard to the manuscript heritage of Ukraine and Greece.

Semiotics as a science covers a wide specter of its activity. Formed in France in the form of the so called Paris school of A. Greimas and asserted as a direction of knowledge of R. Barthes, semiotics expanded the sphere of its influence in the notion of Semiotics of communication by G. Mounin and A. Martinet.

In Italy semiotics is developed by U. Eco and in Switzerland by F. de Saussure. F. de Saussure proposed the 1st program of semiotics, the main principle of which was the form of semiotics that gives unity in combination with the content.

The problems of semiotics were also addressed by such scientists as R. Jakobson (USA), L. Hjelmslev (Denmark), E. Benveniste (France), Z. Harris and N. Chomsky (USA).

During the years preceding the World War II, semiotics was a subject of literature. After the WWII it could be found in art, esthetics, in the sphere of social and humanistic psychology. For instance, in socio-semiotics the language is viewed not only as a carrier of sense and meaning, but as a space of action and interaction, in which a man should perform a deed.

The next step of semiotics was mathematics: R. Thom and his «Catastrophe theory», a mathematical description of the transition of quantitative changes into qualitative ones. The notion of semio-physics, the physics of significant forms, is formed.

Then, pansemiotics, a semiotic view on cosmos, is developed. Here, semiotics is viewed as «total theory of signs», where the irrational is rational and becomes the knowledge due to a man's consciousness.

Then, there was semiotics of fashion, gastronomy, semiotics of a human's body etc.

A remarkable French philosopher D. Diderot made an outstanding contribution to the semiotics of art. Due to his «Salons», he covered the art exhibitions in Paris; and through personal communication with artists, understanding profoundly the individual sides of their art, he introduced innovation and started dividing his reports into two parts. The first part is traditional and the second part is the studies of what an artist wanted to do. The very technical formal aspect of art is interesting for semiotics in this case.

The insight into history and periods of development of semiotics as science presented above shows the complete width of horizons of its activity in the sphere of researches.

One of the tasks of the present work is to see the coupling of semiotics with the manuscript heritage of Ukraine and Greece. The main treasure of any book is a word. Although, in this case, the books mostly carry a traditional word typical for many languages. They are either holy ecclesiastical books or ecclesiastic liturgical books, where the meaning of the word is unified, but the form of representation (language and dialect) is different. For instance, something that was expressed in the form of acrostic (a canon on the week of the Palm Sunday of Saint Cosmas of Maiuma) in the Greek manuscript in Greek cannot be expressed same way in the Slavic manuscript. In this case, to confirm the conclusion of the research, the words of F. de Saussure about semiotics fit well: «Language is a form but not content». «Language is a system, which is subordinate to its own order».

Thus, in this case, the word is unified and the language of a manuscript is an inflectional basis of texts, when the meaning is unified and the form is different.

It is different for manuscript books, which are independent scientific works, for instance, a philosophical work of XVIII century (EBG № 1798) or a work dedicated to the research of musical systems of the Byzantine notation (EBG № 3037).

The philosophical work is written in Russian language with the use of the sign «Ъ». Judging by the form of writing

and language distinctions, it refers to works written in Russian or by a Russian in XVIII century. The text is presented with the help of so called «citoyenne», changes in Russian language introduced by Peter I at the beginning of XVIII. It is an absolutely independent book with unique independent texts written in Russian language in XVIII century. Here, the word has an underlying meaning for the research. As for the language, this book is distinguished because it is among the Slavic (Cyrillic) manuscripts in the Greek collection of the National Library of Greece.

The second of the above mentioned manuscripts is a musical manuscript that studies the Byzantine music. To be precise, the Byzantine musical tonal systems are examined. The approach to the research is mathematical. I. e. apart from the Greek language, in which the book is written, apart from note signs and their letter names and terminological names of tones, there are figures in the book, which speak with us. The word and language of writing in the manuscript play the most important role, but without musical, mathematical and physico-acoustic knowledge it is almost impossible to study and understand this work.

The conclusion is that in the first case the word and the language of writing are independent, but the presence of a code among foreign manuscripts is unique. In the second case, professional terms and musical, mathematical, physico-acoustic signs, semiotic signs, are added to the independent word and language.

Another example of unique books is, for instance, «The history of the Bulgarian kingdom» as part of the Serbian New Testament of XIV century.

In the present case, the book in Bulgarian language hidden in the middle of the New Testament written in Serbian is the conclusion attracting special attention of the researchers.

The conclusion of this research is that a Bulgarian copyist reading the history of his country wrote it in the Serbian New Testament and thus preserved it for the future generations. The chapters of the book are not concentrated in one place, but spread throughout the book — they are hidden. Otherwise, why would anyone document an absolutely different book in the New Testament written in Serbian?

As for the graphic of distinctions of the languages, it especially refers to the Slavic Cyrillic manuscripts. Sometimes in one manuscript there can be up to six handwritings. That is, it was written by different copyists during a certain period of time. And if the code has a unified meaning, the form is different. Same goes for mixed manuscripts, when in one book there are texts, for instance, in Slavic, Greek and Turkic languages.

If the manuscript texts have yuses, yats, Bulgarian «Ж», Romanian apostrophes and similar graphic signs, there is a direct opportunity to study and discover the affiliation of the artefact with this or that tradition with the help of semiotic method of sign-language graphics.

For example, if we refer to some manuscripts written in Slavic language, Cyrillic, which have same verbal text such as the New Testament, how can we understand which of Slavic

traditions these manuscripts belong to? In this case, there is a need for a research with the help of semiotic method of sign-language graphics, where, under a scrutinizing research of the manuscript, its verbal text, the graphic differences of writing of separate letters, consonance and texts are seen. Big and small yus, yats, Bulgarian «ж», Serbian «j», Romanian «'», all of these are distinctive signs that form the entire system of semiotic graphics and differences in the manuscripts of different traditions.

The next stage of the semiotic method of the research of Slavic Cyrillic manuscripts is filigrees or notes on the margins and in the middle of a text. In Greek the word filigree looks like $\sigma\epsilon\mu\iota\sigma\upsilon$ — signs on the margins. It appears that semiotics and the Greek semiosis are almost same-root words. Due to the signs on the margins one can learn about the time of the manuscript's appearance not only in century correlation but also in the form of concrete dates. Semiosis opens for us the authors of manuscripts, buyers, owners, fund affiliation, movement of the code within funds, people and countries.

A separate and very interesting item of the research of semiosis is the presence of seemingly unclear signs on the margins and in the middle of a text.

Such manuscripts include an earlier studied monument (EBG № 1707) kept at the National Library of Greece (Athens). This Slavic Cyrillic manuscript has the Byzantine conductor's system — chironomy. The research of this code was conducted earlier. The main conclusions are that the Slavs preserved for the Greeks their (Greek) tradition in the form of the conductor's system chironomy. Chironomy is really documented in this manuscript. The signs on the margins and in the text, liter symbols of notes are the elements of chironomy. The study of semiosis in the manuscript (EBG № 1707) discovered an opportunity to see and study the Byzantine conductor's system chironomy. For music art this knowledge is unique and important. For modern musical choral singing and conductor's practice, the lack of knowledge of chorus management in the Byzantine era leads to a distorted performance of this music.

Speaking about music, the note systems: neumatic (Byzantine, modern Greek), letter-neumatic (Byzantine, modern Greek), kryuki (kondakar, znamennaya, demevstvennaya), Kievan quadratic, Italian, choral and mensural notations are polysemiotic study. It is polysemiotic, because, as a rule, notations are attracted to a verbal text. Research and revealing of a type of notation can contribute to revealing a tradition or a historic period of the manuscript. Studies of musical tunes or chants written with different kinds of notations are also semiotic characteristics, which help identify a manuscript

belonging to a certain tradition.

Notations or semiography plus semiotics (in a language sense of the word) form another method of research — polysemiotics. Semiography is a theory of science about note (kodakar) signs. Study of separate notations, semiography as independent systems helps understand and learn the reading of a musical notation. But in the practice of performance, semiography does not exist without semiotics and the notes are not performed without a word. Unlike fixed pitch round Italian notations, note systems described above are completely oriented to verbal text.

Another manifestation of polysemiotics is the penetration of language signs (alphabets) in the very note system. Such manifestations occur in the znamenny tunes (marks of A. Mezents), in the Byzantine and modern Greek notations. Thus, polysemiotic method of research of the note semiographic systems penetrates in the depth of the very notations.

Apart from the above mentioned methods of research of the Slavic manuscripts, one should pay attention to the elements of ethnosemiotics. It is about picturesque ornamental insertions that occur on the pages of the manuscript books. As for the style of an ornament, its sign elements, one can define the affiliation of the manuscript with this or that tradition.

The studies on water signs on paper the manuscript is written on can be referred to the same method.

The general conclusion of the semiotic principles in the research of the manuscript fund are as follows: 1) the word is unified and the language of a manuscript is an inflectional basis of texts, when the meaning is unified and the form is different; 2) the word and the language of writing are independent, but the presence of a code among foreign manuscripts is unique; 3) professional terms and musical, mathematical, physico-acoustic signs, semiotic signs, are added to the independent word and language; 4) research with the help of semiotic method of sign-language graphics; 5) $\sigma\epsilon\mu\iota\sigma\upsilon$ — signs on the margins, the base of semiotic researches of the Slavic Cyrillic manuscript fund; 6) for musical manuscripts, the study of chironomic systems; 7) semiography + semiotics = polysemiotics — the study of notations in the context of a verbal text; 8) polysemiotics as a basis of research of the very notations, when letter marks define the movement of notes; ethnosemiotic method of study of manuscripts.

With the help of semiotic research of the manuscripts, there is an opportunity to define more precisely the affiliation of the manuscript to this or that tradition, nation, country and place of writing. There is an opportunity to give a maximally full characteristic of the studied code.

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Section 2. History and archaeology

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Periods in V. Lypynskyi's political thinking: historiographic stereotypes and new approaches to the problem understanding

Abstract: A new, scientifically grounded periodization of V. Lypynskyi's political philosophy is suggested. Interpretation of the debating historiographic problem of evolution and sustainability in political views of the outstanding Ukrainian personality of Polish origin has been given.

Keywords: V. Lypynskyi, territorialism, conservatism, Ukrainian Hetman-monarchist movement.

In the history of the Ukrainian nation there are many figures who were far ahead of time as to their spiritual potential. The figure of Vyacheslav (Vatslav) Kazymyrovych Lypynskyi (1882–1931) is among them: he was a Pole by birth, but a true Ukrainian by his political beliefs. The Ukrainian politician, diplomatic official, historian, journalist, politologist, sociologist, ideologist of the Hetman-monarchist movement — that is only the list of the main incarnations of this remarkable personality.

Despite the considerable number of scientific publications on the life and activity of this outstanding figure, a certain number of problems, requiring further analysis for their final solution, are still remaining in the field of Lypynskyi studies. Among them there is the necessity to understand the debating historiographic problem of evolutionary or sustained nature of Lypynskyi's conservative political outlook, to offer an appropriate, scientifically grounded periodization of his political thinking.

The debates about the evolutionary or sustained nature of V. Lypynskyi's views were started by the scholars representing the Ukrainian expatriate community since the 1950s. Namely, L. Bilas argued that the evolution of V. Lypynskyi's political views had been insignificant and that he had followed the conservative monarchy philosophy for almost the whole of his life, and the ideas of democracy had been alien to him [1]. His opinion was shared by the most of Ukrainian historians abroad, except for Pelenskyi J., who was convinced that the pre-revolutionary period in the life of V. Lypynskyi should be considered democratic, and his conservative views had been only formed with experience accumulation and under the influence of frustration caused by the defeat of national liberation movement of 1917–1921. This was exactly the conclusion he had grounded in his article published as early as in 1957 [2, 197–213].

In the early 1990's J. Pelenskyi suggested the periodization of V. Lypynskyi's worldview evolution that included three

periods: the early one (democratic) — 1908–1919, conservative-monarchist (Hetman) — 1919–1929, independent conservative with a focus on the future Ukrainian constituent as the highest legitimate authority — 1929–1931 [3, 15–29]. To our opinion, this periodization is rather artificial and insufficiently justified.

The discussion of evolutionary or sustained nature of the scholar's political views was continued by the studies of modern national researchers S. Linetskyi [4, 29–42] and T. Ostashko [5, 96–113]. Their viewing of the problem is close to the views of Ya. Pelenskyi and leads to the conclusion that the pre-revolutionary period of V. Lypynskyi and his outlook can be considered as generally democratic, whereas the post-revolutionary period as a conservative one.

In 2012 we had prepared and published the first complete synthetic study devoted to V. Lypynskyi's life, activity and body of work [6]. It is based on achievements of our predecessors and on the extensive documentary basis, offers a comprehensive, systematic view of the personality, highlights insufficiently studied periods of his life and activities, offers analysis of some debating scientific issues, using new approaches.

Analysis of all sources studied in the course of the monograph preparation allowed the author to develop a new periodization of V. Lypynskyi's political outlook which, in our opinion, most accurately reflects the specificity of his views on Ukrainian national liberation movement and on the ways to implement the Ukrainian nation-building at different stages of his social and political activities. Thus, we can distinguish four main periods in life and active social and political activities of V. Lypynskyi, namely: 1908–1917 — territorial — conservative period with a focus on independent Ukraine in the near future; 1917–1919 — statist — territorial period; Late 1919–1929 — conservative-monarchist — Hetman period; 1930–1931 — classocratic-monarchist period [7, 26].

In the pre-revolutionary period, the basis of V. Lypynskyi's political views were postulates of territorialism, conservatism and focusing on independent Ukraine as the ultimate goal of the Ukrainian national liberation movement. Notably, that the first two were the primary ones, as the idea of Ukrainian independence was regarded by V. Lypynskyi as a prospect, though not too remote in time. Therefore, we can define the pre-revolutionary era in its activity and political thinking (1908–1917) as **territorial-conservative with a focus on independent Ukraine**. For the purpose of spreading this very idea of territorialism among the conservative part of Ukrainian society, which Lypynskyi understood as the idea of Ukrainian political nation, he fostered his main efforts in social activism, journalistic and ideology activities of the period. He was trying to spread the same idea among the leaders of the Ukrainian nation, proving the necessity of reorientation of Ukrainian movement from the extra-territorial direction (the struggle for national and cultural autonomy) to the territorial sphere, focusing primarily on the struggle for Ukrainians' national rights and stipulating complete independence of Ukraine in future. Thus, defining this period in the activist's life as a "democratic" one is not reasonable.

In the period of Ukrainian Revolution of 1917–1921, Lypynskyi became a mature politician and statesman. The activist was at the forefront of the first Ukrainian National Party of conservative tramline — UDCP. His role was not only the direct participation in the institutional development of the political organization, but just as well, in the development of its ideological principles [8, 171–181]. The analysis of separate party program provisions, compiled by Lypynskyi, reflects the evolution of its author's political views, shows his foresight as a politician, flexibility of his political thinking, because he, being ready to some compromise in state building issues (this is how his contemporary focus on democratic form of government should be considered), did not deflect from the main goal — the independent Ukrainian state.

During the Hetmanate of Skoropadskyi and UPR Directory, Lypynskyi proved himself as a talented diplomat, who was directly involved in setting up political cooperation of the Ukrainian state [9, 249–262]. He consistently defended the idea of a united national front in the struggle for Ukrainian independence and the territorial-state principle of home and foreign policy. Therefore, the period of 1917–1919 in V. Lypynskyi's life can be defined as **statist-territorial**, because the idea of Ukrainian state was implemented in reality, and the activist considered it necessary to hold and preserve it at all costs. It was the preservation of national independence, with the help of the territorialism principle referring to all the Ukrainian society, that he focused his efforts at.

In the exile period, V. Lypynskyi managed in a short time to initiate and develop a new political line in the Ukrainian national liberation movement of the twentieth century. That went down in history as monarchist Hetman period. The role of the activist was both the organizational design of the main political structure of the movement — USCD, and developing a harmonic, theoretically grounded ideology, which his activity was based on. The basis of the mentioned ideology comprised conservatism, territorial patriotism and the patrimonial idea of a constitutional monarchy in the form of traditional Ukraine Hetmanate.

Creating the Ukrainian theory of labor monarchy, V. Lypynskyi tried to restore the structure of the Ukrainian nation, to establish balance between its progressive left and conservative right parts, and insisted that successful state-building is only possible at the condition of the social cohesion in society. V. Lypynskyi believed the territorialism principle to be another important political basis for creation of their own State, which he opposed to nationalism. Only on this basis it was possible to implement the real social solidarity of all the population of Ukraine, which would permit to create rather than destroy their own state in the name of "common interests of the common Earth" [10, 154]. He assigned the leading role to the conservative stratum of the population, the core of which he considered to be Ukrainian peasantry element.

The only possible form of government in Ukraine, which would ensure the appropriate structure of the conservative segment, so that it would fulfill its state-building functions, V. Lypynskyi considered the constitutional hereditary monarchy headed by Hetman, whose power was limited by the common law for all citizens. The patrimonial monarch himself, i. e. the Hetman, was to be primarily the embodiment of the principle of national and state unanimity and sustainability of the national tradition, that would secure Ukrainian state from ruining and from the corrosive influence of external forces. Close to the type of monarchy suggested by V. Lypynskyi was British monarchy, where the king or the queen perform not legislative, but representative functions, and thus provide existence of the historical tradition and the continuity of the state [11, 89]. On the basis of the analysis of V. Lypynskyi's political thought and activity, we can define his life time since the late 1919 till 1929 as a **conservative-monarchist Hetman period**.

The conflict between the two trends inside the Hetman executive body — idealistic and realistic — led to a split inside the political movement, the result of which was V. Lypynskyi's attempt to establish a new Hetman movement with an emphasis on its classocratic monarchial essence, and his rejection of the idea of Hetmanate personification. Respectively, this last period in the life of a prominent politician (1930–1931) should be defined, in our opinion, as the **classocratic-monarchist** one.

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Abdulhamid al-keshi great of muhaddiths central asian

Abstract: This article is about Abdulhamid Abu Muhammad Keshi In the VII – XII thcentures in Mavarannakhr were lived a lot of islamic scientists. One of the most known scientist was the great muhaddith Abdulhamid Keshi, who was as a master to the Imam Bukhari, Imam Termizi and to the Imam Muslim ibn Hajjaj. Abdulhamid Keshi was born in Kesh and his full name was Abdulhamid ibn Humayd ibn Nasr Abu Muhammad Hofiz Keshi. He wrote many scientific works as a «Musnadi Abd», «Tafsiri Abd» and etc.

Keywords: Abdulhamid Keshi, Kesh, Mavarannakhr, Hadith, muhaddith, «Musnadi Abd», «Tafsiri Abd».

In the history of Islam the 9th-12th centuries are considered to be the golden period as during this period science and Islamic civilization developed highly and such sciences as Hadith, law, philology, logic, interpretation and commentary writings reached their highest peak. The representatives of these branches of science — Khoesmis, Bukharis, Samarqandis, Termizis, Nasafis, Keshis, Shashis and Ferganis appeared on the scene of the science of that time. During the years of Independence the lives, activities and scientific careers of most of these scholars have been studied and investigated, but much is still to be done in this area.

One of such connoisseurs of the science of Hadiths and the teacher of Imam Bukhari, Imam Termizi, Imam Darimi and Imam Muslim ibnHajjaj was Abd ibn Humaydibn Nasr al-Kashshi (Keshi) who was titled as “Hafizu-l-Hadith”, “Sahibu-l-musnadi-l-kabir” and “Sahibu-t-tafsiru-l-kabir”. His full name was Abdulhamid ibn Humaydibn Nasr Abu Muhammad Hafiz al-Keshi. He is supposed to have been born in 170/786 in Kesh. [15, 235] However, some sources say that he was born later than 170 in accord with Muslim calendar.

Abd ibn Humaydibn Nasr al-Kashshi was the teacher and tutor of three great experts in the science of Hadiths — Imam al-Bukhari, Imam at-Termizi and Imam Muslim ibnHajjaj.

Abd ibn Humayd ibn Nasr al-Kashshi was one of the leading specialists in the field of Hadiths, law and philology and was honoured as “al-Imam, al-Hafiz, al-Hujjat, al-Jawal” [15, 236], etc. In some other historical sources, he was also exalted with pennames as “Keshi, Kesi, Laysi [7, 144], Ka’bi [11, 147]”, etc. The fact that different historians approached to his personality and legacy from different points of view shows that his legacy has not been investigated well enough yet.

Abd ibn Humayd ibn Nasr al-Kashshi is one of the earliest representatives of the science of Hadiths who was educated in Maveraunnahr and paid great attention to the correctness and accuracy of Hadiths.

Abd ibn Humayd ibn Nasr al-Kashshi got his first education in Maveraunnahr. At the beginning of his career, he began to attend the best-known schools of Bukhara, Samarkand and Kesh. As was mentioned in the book “Tarikh-al-Islam” (The History of Islam) by a historian Shamsuddinaz-Zahabi,

Abd ibn Humayd ibn Nasr al-Kashshi visited more than two hundred cities of the Islamic world in search for knowledge. Wherever he attended, he had scholarly talks with the leading specialists of the science he was interested in, took an active part in the debates and discussions of the type, and collected Hadiths with all their chain of roviys. [16, 425].

At the time when Abd ibn Humayd ibn Nasr al-Kashshi and other experts of Hadiths of his time began their careers, it was already two hundred years since the time of death of Prophet Muhammad (saas) and most specialists had gone to different parts of the world with the purpose of spreading the teachings of the Prophet (saas). Wherever they went, they tried to spread and disseminate the ideas of the Noble Qur'an, Hadiths and other teachings of Prophet Muhammad (saas). It was natural that the main purpose of scholars was to collect and process the sayings of the Prophet (saas) and disseminate them among the ordinary people. Abd ibn Humayd ibn Nasr al-Kashshi visited Baghdad, Basra, Kufa, Syria, Naysabur, Mecca, Medina and other cities of the Islamic world, and there he not only attended the lectures of the leading specialists and took part in the scientific discussions of different subjects dealing with Hadiths but also taught lessons to the students and educated his followers on Hadiths and their interpretations.

Abd ibn Humayd ibn Nasr al-Kashshi had relations on different fields of knowledge and science with many specialists. We would like to mention the names of some well-known scholars. They were: Abu Davud Taylasi, Nazr ibn Shamil Marvazi, Yahya ibn Adam, Yazid ibn Kharun, Abu Bakr ibn Abu Shayba, Abu Valid Taylasi, [3, 304] Abu Ali Hanafi, Abdurrahman ibn Abdullah Dashtaki, Umar ibn Yunus al-Yamami, al-Vaqidi [15, 236] and some other specialists in the science of Hadiths, interpretation, etc. Abd ibn Humayd ibn Nasr al-Kashshi provided the names of these experts in his book "Tafsir al-Kabir" and "Musnad al-Kabir" and included some Hadiths mentioned by these scholars and classified them according to his own principles of classification. [18, 78].

In his book «A'lam an-Nubuwwat», Imam al-Bukhari writes the following about Abd ibn Humayd ibn Nasr al-Kashshi: "Abd ibn Humayd is actually Abdulhamid Abu Muhammad. He was one of the Sheikhs of Muslim ibn Hajjaj". [4, 10].

One more example in this respect: as was submitted for consideration in the book "Tarikh al-Islam", "the scholars and experts in different fields of science often used to get together for discussions and scientific debates on Hadiths and their interpretations at the time when Abd ibn Humayd ibn Nasr al-Kashshi lived.

In his book "Siyara'lam an-nubala", Shamsuddinaz-Zahabi mentions that Imam al-Bukhari, Imam at-Termizi and Imam Muslim used to take Hadiths from the works of Abd ibn Humayd ibn Nasr al-Kashshi and interpreted them. They were considered to be the followers of the latter [15, 235].

Historical sources inform us that Abd ibn Humayd ibn Nasr al-Kashshi's son Muhammad ibn Abd also used to take and interpret Hadiths from his father's works who was con-

sidered to be the leading specialists in the science of Hadiths [16, 425].

The list of specialists in the field of Hadiths who took Hadiths from Abd ibn Humayd ibn Nasr al-Kashshi is too long and their number is great. Some of them are: Ibrahim ibn Hazm ibn Fakhr al-Lahmi Shashi, Abu Ma'az U'badi ibn Idris ibn Bukhash Keshi, Sahlibn Shazavi al-Bukhari [3, 304], Bakr ibn Mirzaban, Shurayhibn Abu Abdullah Nasafiaz-Zahid, Muhammad ibn Abd ibn Omir as-Samarqandi, Ibrahim ibn Khuzaym ibn Qamir ash-Shashi, Abu Sayyid Hatam ibn Hasan Shashi, Salman ibn Israil ibn Jabir Khojandi, Abu Said-shah ibn Ja'far ibn Habib Nasafi, Abu Bakr Muhammad ibn Umar ibn Mansur Keshi, Muhammad ibn Musa ibn Huzayl al-Nasafi, Mahmud ibn Anbar ibn Nairn al-Azdi an-Nasafi and some other experts in Hadiths, law, history, etc. [15, 236].

As has been mentioned in one of the sources, one of the last followers of Abd ibn Humayd ibn Nasr al-Kashshi is considered to be Ibrahim ibn Khuzaym ibn Qamar ash-Shashi.

Abd ibn Humayd ibn Nasr al-Kashshi was one of the famous scientists in religious sciences who were educated in Maveraunnahr. His field of interest was very wide. He was interested in Hadiths and their interpretations, Arabic grammar and Hanafian law, and he created precious works in these fields of science respectively. In his "Kitab al-ansab", Abd ibn Humayd ibn Nasr al-Kashshi deals with the rules of the Arabic grammar which includes such booklets as "Kitabala-l-hurufva-l-mu'jam", "At-Tasarruf" and "Kitabfa'altuvaafa'ltu". These books occupy a special place in the list of books as the first pioneers created in Maveraunnahr in these fields of science. [9, 149].

In his book "Kashfaz-zunun", Hoji Khalifa writes that Abd ibn Humayd ibn Nasr al-Kashshi was also the author of such books as "Tafsir Abd ibn Humayd", [6, 453] "Sulasiyat Abd ibn Humayd Kashshi" [6, 522] and "Musnad Abd ibn Humayd". [10, 151].

Abd ibn Humayd ibn Nasr al-Kashshi was also a well-known lawyer in the field of teaching the Hanafian order. He made a great contribution to spreading and disseminating the teachings of the Hanafian trend in Maveraunnahr. The number of scientific works created by Abd ibn Humayd ibn Nasr al-Kashshi is great but we have perfect information about the following books of the author: "Musnad Abd ibn Humayd", "Tafsir Abd ibn Humayd", "Sulasiyat Abd ibn Humayd Kashshi", "Kitabala-l-hurufva-l-mu'jam", "At-Tasarruf" and "Kitabfa'altuvaafa'ltu".

Some selected parts of the book "Musnad" have reached us and this work was published under the title of "Al-Muntahab min Musnad Abd ibn Humayd" in Cairo in 1988 at the publishing house "Maktabat-Sunna" by the editors Subhil Badri as-Samarani and Mahmud Muhammad Khalil as-Sa'idi.

The book "Musnad" by Abd ibn Humayd ibn Nasr al-Kashshi is a source of great importance because the principles of choice of Hadiths, their principles of collection, classification and interpretation as well as styles of writing are good, clear, reliable and readable.

This book is known in the history under the title of “Musnad Abd ibn Humayd”. It is one of the reliable and rare books in the Islamic world because it begins with the names and under the witnesses of the most famous and respectable figures after Prophet Muhammad (saas) such as Abu Bakr Siddiq, Umar ibn Hattab, Uthman ibn Affan and Ali ibn Abu Talib, and the Hadiths provided in the book were borrowed from those estimated followers of Prophet Muhammad (saas). For instance, the first seven Hadiths were borrowed from Abu Bakr Siddiq, thirty-eight Hadiths from Umar ibn Hattab, nineteen Hadiths were taken from Uthman ibn Affan and thirty-three Hadiths from Ali ibn Abu Talib. They were classified and listed according to the degree they earned in the Islamic science and included into “Musnad”.

“Musnad Abd ibn Humayd” is a famous book that includes 1599 Hadiths in total from fifty-seven sahabas and each Hadith is given with its full characteristic features and its place in the list of classification [1, 40].

The fame and wellness of “Musnad Abd ibn Humayd” is in the fact that the Hadiths borrowed from Abd ibn Humayd ibn Nasr al-Kashshi’s this book and “Tafsir” are mentioned and praised in several solid and famous books in the Islamic world. For instance, in “Ad-Durru-l-mansur” consisted of ten volumes the Hadiths borrowed from them are mentioned in, 2205 places, [2, 10] in Imam Shavkani’s book “Fathu-l-qadiyr” involving twenty-four volumes in 689 places [8, 8] and in Abu Ja’far Tabari’s “Tafsiru Tabari” in 45 places [13, 24].

In Imam Muslim’s book “As-Sahih” 138 Hadiths, [14, 20] in Imam at-Termizi’s book “Sunani Termizi” 152 Hadiths [12, 8] are borrowed from “Musnadi Abd ibn Humayd” by Abd

ibn Humayd Kashshi. These facts show that “Musnadi Abd ibn Humayd” was famous enough to be acknowledged by the leading experts in the science of Hadiths.

Abd ibn Humayd Kashshi was an acknowledged expert in Hadiths and law. He was also a very good specialist in analysing the quality of Hadiths. One more important book that belongs to his pen was “Tafsir Abd ibn Humayd”. [5, 202] It was studied by a lawyer Mukhlif ibn Banihi al-Urf and published in 2004 in the publishing house “Dor ibn Hazm” under the title of “Qit’atun min tafsir al-Imam Abd ibn Humayd” (A Part from Abd ibn Humayd’s Tafsirs). Consisting of one volume, the book contains some interesting information concerning the Suras 1 from the Holy Qur’an “Al-Imran” and “An-Nisa” characterizing them from different points of view, some information about the author of the book, the importance of the book, the correctness and accuracy of the information provided in the book.

Some selected materials from the works “Musnad ibn Humayd”, “Sulosiyot Abd ibn Humayd” and “Tafsir Abd ibn Humayd” created by Abd ibn Humayd Kashshi have reached us.

Historical sources unanimously point out that Abd ibn Humayd Kashshi died in 249/863 but the place of his death is shown in different sources differently.

The Central Asia constitutes the heritage of muhadith, they will need to carry out in-depth research on. The hadith of muhadith collections, research, and use them to educate the youth is of great importance in understanding the true essence of the religion of Islam and its implementation is reached, society, religion is associated with the elimination of all kinds of trouble.

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The problem of the historical and cultural ties (the Irish question in translations of M. K. Tsebrikova)

Abstract: The article considers the problems of establishment of Ireland in the second half of the 19th century. The Irish issue is characterized by extreme complexity and uniqueness. For a long time Ireland has often witnessed serious social and national contradictions, which attracted the attention of political and social circles in many countries of the world, including Russia.

Keywords: civil rights, independence, politics, liberation movement, progressive ideas, journalism, social contradictions.

Throughout its history, Ireland has been famous for its ambition for independence. The period considered in the article, the second half of XIX century, was the time when the planned movement for human rights continued in spite of hard consequences of the Great Famine in 1845–1849 for the Irish people and systematic robbery of the Irish peasants. Fenians, small bourgeois revolutionaries, who expressed the protest of the Irish peasants against the deprivation of land in their requirements, started playing a noticeable role in the political life of the country and tried to achieve the independence of Ireland by way of a plot. The rebellion of fenians in 1867 was suppressed and further 49 years were a new stage of the peaceful constitutional struggle, which was especially pronounced in the struggle for Home Rule, self-management within the British Empire.

The progressive-minded people in Russia of this time had a big sympathy and followed the struggle of the Irish for their independence from the British Empire with understanding. The national press published not only news, but also works related to the history of the Irish freedom movement.

Numerous publications in the Russian papers «Otechestvennye zapiski», «Iskra», «Nedelya» etc. certify about the sympathy for the struggle of Ireland for its rights and absolute condemnation of the English government persecuting the Irish public figures. The «Otechestvennye zapiski» publishes the poems of T. Moore translated by A. Plescheev «From the Irish Melodies» [1], «To Ireland» [2], the stories of M. Laffan «The Irish Revenge» [3], «In the streets of Dublin» [4], «Dublin slums» [5], articles of N.N. Firsov «The Irish Question» [6]. A big interest in the disastrous condition of the Irish population was expressed by M.E. Saltykov-Schedrin. In 1875 the jubilee (100 years) of the national Irish hero O'Connell was widely celebrated in his motherland and the journal «Nedelya» informed the Russian readers about it [7].

M.K. Tsebrikova, a literary critic and publicist known to a progressive reader of that time, teacher, publisher, an employee of Nekrasov's «Otechestvennye zapiski» and other famous Russian journals, editor of one of the best pedagogical journals «Upbringing and Education» [9], translated the novel of J. McCarthy «A beautiful Samsonian» offering the editorial of «Otechestvennye zapiski» the name «For freedom», which renders the idea of the work more precisely. Out of the censor considerations, the novel was called «The descendent of the Tairons». The novel was placed in the Enclosures №№ 1-4. A year earlier, in 1873, M.K. Tsebrikova translated and published the notes of W. Stewart Trench as a separate book and named them «Sketches of the Irish life» [10]. The works selected by M.K. Tsebrikova that undoubtedly were in keeping with the spirit of the time were dedicated to the Irish questions. She referred to them at the time when the struggle of the Irish for the independence of their motherland became strained again. Both works were provided with wide prefaces and comments of the translator, in which she expressed her understanding of the Irish question, with connection to the Russian life. This similarity was noted by many progressive public figures of Russia. Thus, N.K. Mikhailovsky wrote in «Literary and journal notes» about the book of W. Stewart Trench: «In this book, the reader will see what it means to be a landless owner. It is interesting as itself, but also with regard to us, the citizens of the country of farmers and land owners» [11. P. 149.]. There is a direct «analogy between the Irish sept and the Russian peace» in one of the articles of «Slovo» journal [12. P. 3.]. In the books of W.S. Trench and J. McCarthy about Ireland translated by M.K. Tsebrikova, a question of extremely disastrous condition of the Irish people and the painful search of ways of its struggle for independence is raised in her prefaces and comments.

W. Stewart Trench, the author of the notes about Ireland, served as a manager at landlords' estates in Ireland. In spite of

some conservation of social and political beliefs, he felt sorry for the Irish deprived of the human conditions of existence and tried his best to help them. The author of translations addresses the author of the notes with respect, because she can see that «... Mr. Trench can put aside the views of a landlord's agent and take a wider look at the position of the Irish people» [12. P. 3.]. N. Mikhailovsky also referred to the book of W.S. Trench as a sincere and trustworthy work. Sympathetic attitude of «hard worker Trench» towards the suffering people was noted by F. Engels: «Trench says to a liberal signore that if he was an Irish peasant, he would also become a ribbonist» [13. P. 300.].

The translation of J. McCarthy's novel «The descendant of the Tairons» by M.K. Tsebrikova acquaints us with another form of struggle of the Irish for independence – fenianism. The fenianism had a narrow nature; fenians stuck to a plot tactic. The academician E. Tarle characterized the program and methods of the fenians as a manifestation of small bourgeois insurgency movement. The notion of a deserving Irish national character is completed with the protagonists of John McCarthy's novel «The descendant of the Tairons». Unlike W.S. Trench, who introduced the readers to hard-working farmers, J. McCarthy acquaints them with simple people and the descendants from the Irish aristocracy.

The protagonist of his novel Tairon is a descendant of an ancient Irish family. He obtained good education and occupies a solid social position; he has love and trust of people, who elect him a representative of Ireland to the English parliament. He has a reputation of an honest, decent and incorrupt man.

Tairon meets the requirements of that part of the fenians, who wanted to render lands and power to ancient Irish families exiling the landlords. Their struggle for restoration of the Irish oligarchy is combined with a desire to get rid of Protestantism imposed by the conquerors and establish the religion of their ancestors – Catholicism.

Invited to a meeting of plotters, Tairon, who they would want to see a leader of the Irish movement, mildly refuses the flattering offer. Moreover, he goes to Ireland with an intention to talk the fenians out of rebellion as he understands that it will be suppressed and bring futile victims and a disgrace of defeat. The agreement would provide him with an eminent role of a leader as a descendent of an ancient family, who would be treated with awe by the Irish, but he considered it a crime to exploit this feeling of people who adored and believed in him and lead them towards inevitable death.

When the government finds out that Tairon kept the fenians from the rebellion, they offer him a favorable position out of gratefulness, which he refuses, because he cherishes his independence and makes a decision to step down from politics.

Brought up on the stories of irreconcilable national feud, he managed to overcome this feeling and found courage to confront the commonly accepted norms of the majority.

J. McCarthy shows the way of painful searches of an appropriate form of struggle for his protagonist. His strong mind is uncomfortable in the narrow frames of the national feud, as the author notes. His protagonist starts understanding that «the path of every public figure aware of their tasks does not go where there is blood and fire of the national feud» [15. P. 33].

Being a Member of Parliament, Tairon saw those feeling sorry for the Irish people and wishing the freedom of Ireland among the Englishmen. With all its drawbacks, contemplates Tairon, the English parliament has people who want justice for the Irish people as they do for their own. They are the minority, but their number will increase with time and gradually they will achieve the adherence to their requirements.

Tairon decides to achieve the independence of Ireland by way of a parliamentary struggle. It was a position that the national hero of Ireland O'Connell stuck to, who cultivated the understanding of an advantage of wide campaign instead of plots and rebellions in the consciousness of the Irish. The protagonist of the novel was right foreseeing the suppression of the rebellion, but it didn't disturb his belief in the eventual victory of the Irish. Understanding the wrongness of the position of the fenians, Tairon detaches himself from their movement. National fanaticism and revolutionary feud will not lead to an expected result. Intending to fight for freedom and against the violence of both peoples, Irish and English, Tairon is convinced that time should pass before both peoples will give a hand to one another. It is evidenced by the fact that the working class of England followed the freedom fight of the Irish people with sympathy and angrily protested the violent politics of the English colonizers in Ireland.

Relying upon the translations of the works of W.S. Trench and J. McCarthy, M.K. Tsebrikova demonstratively proved that the reason of unrests in Ireland was an unbearable condition of the people, which it was put in by the conquerors. Going through a long and hard path of struggle, from a spontaneous unrest of terrorism by ribbon men and plot tactic of the fenians, the people of Ireland will come to recognition of the parliamentary form of struggle and achieve independence and self-determination. The history of Ireland helped understand the nature of struggle of its people for independence and drew attention of the Russian readers to different forms of struggle with despotism in Russia. Political guess of M.K. Tsebrikova about the importance of the Irish problem, soberness of assessment of the Irish events, political resume in prefaces are absolutely proved by the history of peace and further national freedom movement in Ireland. Translations of the preface and remarks of M.K. Tsebrikova are not only historical documents. In the context of modern times, they are perceived as live political wisdoms and moral values, which have continued importance.

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Section 3. Medical science

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Informational content of biochemical structure of the saliva at children after treatment by fixed orthodontic appliances

Abstract: In this study we compared research the saliva of patients with Radio activation neutron method (determination of the mineral composition of saliva). 20 candidates 14-16 years old with bracket system between January 2012 and 2014, 10 on which in control (bracket system used light cure) group and 10 used adhesives group. We consider thus, the mineral structure of a saliva is one of the major factors defining processes of a mineralization of firm tissues of teeth and their resistance to cariesogen influences.

Keywords: Mineralizing function of a saliva, Radio activation neutron method, anomalies of dentition, structural changes of the tooth.

Introduction

Mineralizing function of a saliva is reduced to maintenance of chemical composition of firm tissues of tooth, especially enamels. The saliva contains all necessary mineral components which are a part of tooth, organic substances, vitamins, and also hormones and biologically active connections controlling process of a mineralization. The saliva is saturated with ions of calcium, magnesium, phosphate and the chlorine which high concentration promote moving of ions to enamel that is important in the course of a tertiary mineralization of enamel, i.e. after a tooth left, and does it resistant to caries development. Quite often damages of teeth arise because of violation of sekretoral function of glands and a chemical composition of a saliva. The powerful proof of a role of mineralizing function of a saliva is development of multiple caries at a giposalivation of various genesis.

Objective

Low level of salivation is the most important risk factor of development of caries of teeth.

The quantity and structure of a saliva of the person are varied in wide by the predeklakh and depends on the time of day, eaten food, age, a condition of the central and vegetative nervous system, and also existence of diseases. In norm sub-

mandibular glands allocate 69%, auricular- 26%, hypoglossal - 5% of a saliva of the total amount of a daily secret of glands.

In days it is produced from 0,5 to 2,2 l of a saliva, pH of a saliva fluctuates from 5,5 to 8,0. The important factor influencing structure of a saliva is the speed of its secretion making in a quiet condition of 0,24 ml/min. However the speed of secretion of a saliva can fluctuate even at rest from 0,01 to 18,0 ml/min. and increase when chewing food to 200 ml/min.

The saliva carries out a number of important functions, namely: mineralizing, protective, regulatory, excretory.

Thanks to existence as a part of a saliva and - amylases, maltose in a mouth there is an initial stage of digestion of carbohydrates. A part in digestion of proteins is played trypsin by similar enzymes, a pepsinogen, in digestion of lipids - lipases, and also the nucleases promoting splitting of nucleic acids.

The protective effect of a saliva isn't limited to oral cavity fabrics. Believe that the part of the gel covering a mucous membrane of a stomach, occurs from saliva components (Kodaira H. et al., 1999).

O. I. Sukmansky (1991) notes that salivary glands influence a calcium exchange, a mineralization of teeth and a skeleton, regulation of growth and development of fabrics, a metabolism of carbohydrates, proteins and lipids, a tone and

permeability of vessels, and also participate in adaptive reactions of an organism.

The saliva contains the components of buffer systems possessing ability to neutralize acids and alkalis. Secretion of a saliva happens reflex. Salivation begins or under the influence of the unconditioned reflexes caused by receipt of food in a mouth, or it is conditionally reflex at a look or a flavor of food.

Thus, salivary glands synthesize a rich set of biologically

active agents making humoral and local impact on bodies of an oral cavity and a number of physiological systems of an organism.

Mineral components of a saliva

Among mineral components of a saliva sodium, potassium, calcium and magnesium prevail. The mineral structure of a saliva is presented in the tab.

Table 1. – The maintenance of mineral elements in the mixed saliva of the person

Indicator	Norma	The literature
Potassium, mmol/l	5,29	Petrun N.M., Varchenkko LI. 1961
Potassium, without stimulation, mmol/l	11,76-27,61 18,0-19,0	Pedanov Yu.F. 1992
with stimulation, mmol/l	1	Pedanov Yu.F. 1992
Calcium the general, mmol/l	1,28 + 0,08	Sayapina L.M. 1997
Calcium the general, mmol/l	0,5	Petrun N.M., Varchenkko LI. 1961
Calcium ionized. mmol/l	0.08-0,53	Pedanov Yu.F. 1992
Magnesium, mmol/l	8,8	Petrun N.M., Varchenkko LI. 1961
Phosphorus inorganic, mmol/l	6,5-21.7 43,0-46,0	Pedanov Yu.F. 1992
Phosphorus inorganic, mmol/l	10	Petrun N.M., Varchenko LI. 1961
Chlorine, mmol/l	3,23-5,07	Pedanov Yu.F. 1992
Cobalt, mmol/l	21,6	Petrun N.M., Varchenko LI. 1961
Copper, mmol/l	118,8	Snyder Chairman W.S. et al. 1975
Iron, mmol/l	4,09	Snyder Chairman W.S. et al. 1975
Iodine, mmol/l	0,9	Pedanov Yu.F. 1992
Fluorides, mmol/l	275,8- 1891,2	Snyder Chairman W.S. et al. 1975
Bromine, mmol/l	5,26-10,53	Pedanov Yu.F. 1992
	1.25	Snyder Chairman W.S. et al. 1975

The saliva belongs to mineralizing liquids. It is a source in an enamel of ions of calcium and phosphorus. Shift of reaction of a saliva in the sour party (pH <6,4) promotes demineralization of an enamel and caries development as conditions for receipt of ions of calcium and phosphorus from the mineralized fabrics in a saliva are created. Especially the importance in initiation of process of demineralization of an enamel has development of the acidophil microorganisms, capable to ferment sucrose and to form a large amount of milk acid.

Thiocyanates (thiocyanates) (CNS) carry out antibacterial function.

Saliva microcells: zinc, copper, bromine, cobalt, and also macroelement magnesium carry out coenzymes function and take part in processes of a metabolism and a mineralization of teeth (fluorine, strontium, etc.). There is a row the of enzymes: alkolgoldehydrogenaza, glutamatdehydrogenaza, lactodeghydrogenaza. Fluorides in a saliva play a role of stabilizers of a hydroxyapatite. In mineral fraction of bone fabric and teeth fluorine joins in a crystal lattice. Tooth enamel - the most saturated this microcell fabric. The lowered content of fluorine in

drinking water (less than 0,9 mg/l) promotes caries development. In regions with the insufficient content of fluorine high incidence of the population of caries is noted. Water fluoration, application the remineralization of the mixes containing fluorine connections, and the fctorsoderzation of pastes is one of effective methods of prevention of caries of teeth.

Materials and methods

The study design was approved by the local ethics committee of Tashkent Pediatric Medical Institute department of Otorhinolaryngology and Stomatology Tashkent, Uzbekistan. 20 candidates 14-16 years old with bracket system between January 2012 and 2014, 10 on which in control (bracket system used light cure) group and 10 used adhesives group. Patients with anomalies of dentition, crowding the upper and lower teeth of dentition, and three teeth diastema of upper and lower jaws was fixated with bracket system.

During two years patients was hold consultation every 3 month. Hygiene and ph-metry of the tooth and oral cavity.

To know demineralization degree of saliva we used Radio activation neutron method (determination of the min-

eral composition of saliva). Institute of Nuclear Physics, Tashkent, Uzbekistan.

Esthetic, structural changes of the tooth, demineralization

degree are important moments in our study.

- saliva of 3-5 ml, in a test tube not stimulated mixed saliva.

The patient spits out in a test tube.



102 – Akhmedova G.



202 – Kamoliddinova N.

Results

Ph – metry showed us low-pH solutions pH 5.97 ± 0.02 in two patients.

The maintenance of elements in samples at studied patients, mkg/g

Element	Saliva	
	102	202
I	<0.1	180
Mg	<50	<50
Cl	114000	47200
Cu	25	<1.0
Mn	3.0	9.9
Na	28400	10100
K	166000	115000
Ca	3760	11400
U	<0.1	<0.1
Au	0.017	0.13
Br	115	36
La	0.56	<0.1
Se	<0.1	<0.1
Hg	<0.01	<0.01
Cr	3.5	16
Ag	0.40	1.8

Sc	0.031	0.13
Rb	110	66
Fe	190	500
Zn	15	130
Co	0.21	1.7
Sb	0.11	0.78
Sr	<10	<10

102 – Akhmedova G. Conclusion. Lack of iodine. To accept iodine preparations. To address to the urologist. To make the cardiogram. Deficiency of potassium. Lack of copper, manganese, selenium and iron. To accept potassium preparations, selenium preparations with vitamins A and E, iron preparations with vitamin C, polivitamins with copper and manganese. The raised content of zinc. To establish the reason. To pay attention to cardiovascular system. Problems of the Intestinal Path (liver) are possible.

202 – Kamoliddinova N. Conclusion. Deficiency of potassium and iodine, Lack of copper, manganese, calcium, selenium, zinc and iron. To accept potassium preparations, calcium preparations with vitamin D, selenium preparations with vitamins A and E, iron preparations with vitamin C, polyvitamins with copper, iodine, manganese and zinc (ALPHA-BET). To pay attention to the immune - system. Problems of

the Intestinal Path and liver problems are possible.

Discussion

In this study we compared research the saliva of patients with Radio activation neutron method (determination of the mineral composition of saliva). Institute of Nuclear Physics, Tashkent, Uzbekistan. The use of this new technique of research has received remarkable research attention. Results in small study groups have been encouraging; however, they have requested for evaluation with larger numbers and evidences from other centers.

Therefore, we believe that the Radio activation neutron method is an effective and cost-effective method.

Conclusion

We consider thus, the mineral structure of a saliva is one of the major factors defining processes of a mineralization of firm tissues of teeth and their resistance to cariesogen influences.

Conflict of interests

Authors have no conflict of interests.

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Improvement of training of public health officials in Republic of Kazakhstan

Abstract: Nowadays, when modern public health system is developed, much attention is paid to professionalism of public health officials. Therefore, an important component is the improvement of quality and efficiency of their professional training. A precondition for better training of adult students is to focus on their professional and personal needs.

Keywords: public health officials, training.

The need in improvement of professionalism of medical specialists in Kazakhstan is caused by current social and economic conditions of the updating society: establishment of market relations including those in social industries, extension of international relations, and integration processes.

The public health system is not an isolated system. It is a component of national economy. Therefore, any changes in political, economic and social spheres of the society (both positive and negative) influence its stability, and determine its prospects.

The issue of raising of professional skills is one of many factors hampering the implementation of innovative processes in practical public health. Often, passivity of thinking of many medical and pharmaceutical workers, and habitually conventional way of raising of professional skills impede their personal and professional development [1].

Therefore, much depends on arrangement of training at higher education institutions so as to focus on development of personality of adult students, who have the established thinking patterns. A feature of modern training of adults is that the persons are trained to be acmeologically oriented subject to relevant components of acmeological training and pedagogic design. It is widely known that acmeology as a science emerged at the confluence of natural sciences, humanities, and social sciences, having an independent subject of study, phenomenology of regularities, mechanisms and methods of personal development at the age of maturity, when the highest point of development is achieved. Acme (Ancient Greek) means the period of physical and spiritual maturity of a person, which is achieved by about 40 years of age [2].

The bottleneck of training of public health officials, especially, managers of various levels, always was the prevalence of theoretical (lectured) materials, excessive academicism, distance and estrangement from students, and low number of hours of seminars. At the same time, the practice of seminars held with active training methods (such as 'fish tank', 'brain storm', etc.) is more preferable for students. It allows the students to digest material better, work on decision-making skills, group communication skills, and ability to lay out a position, or opinion, and defend it in a discussion, which is very important for personal growth of a student.

Although, at our chair, basic, frontier and final control tests have been used for a few years, it is very hard to properly determine whether the training is efficient or not.

How is it determined whether training is efficient or not? Is it based on positive feedback from students or the results of examinations, or control tests at the end of the training? The managers, who send their employees to refresher courses, perhaps, are not very interested in such criteria. They are more interested that the knowledge obtained at the training result in successful work of medical organization and its business units. That is, the customer wants to be sure that various managers, who were trained, can show specific results: to improve their work, increase work performance, establish favorable psycho-

logical environment in the labor collective, and properly settle legal issues, etc.

A main component of successful training is efficient communication. At all the stages of training (determination of scope of knowledge and skills to be acquired by students at some or other stage; elaboration of the curriculum and course program; training; estimation of training results), the communication plays important role. For example, for identification and specification of the training needs of students, the teacher may conduct either basic questioning or conversation. When the curriculum of training course is elaborated, the teacher must understand and take into account the features of communication (communication principles), so that the course prepared subject to the results of basic questioning will become consistent, lessons exciting, and materials of lecture easily digestible. It is necessary to know how to catch and keep the attention of the audience, and how to make the students interested, and how to lay out the material and focus on the most important issues, which is various sides of communication.

The model of task-oriented communication is useful to understand the regularities of communication and its connection with training. This model has a few advantages: it is focused on mutual interaction, and by using the model, one can eliminate many obstacles impeding proper communication.

That said, one issue must be noted, which was faced by foreign specialists in the field of manager training. The attempts to implement ready models of management of different countries without taking into account local business and cultural traditions often were unsuccessful [3]. The disregard of local cultural features, which influence character and personality of a student is a reason for some failures in implementation of ready models. The understanding of communication patterns allows to eliminate the obstacles hindering communication, allows a teacher to clearly determine the training needs of students in training, and adjust the training subject to local customs and political system. Such approach allows, finally, to determine what students are interested in, and what they need when raising their professional skills. As a result, the theoretically oversaturated training programs were reviewed, and later, adjusted according to the practical needs of customers.

What must be admitted when estimating foreign practices of training is that when training needs are estimated, it is necessary to determine the initial level of a student: both professional level and his/her attitude to training, as well as his/her emotional disposition. For example, a student sent to the training by his/her manager, most probably, will have the attitude different from that of the student, who came to the training at his/her own wish. At the beginning of training, sufficient time is required to catch the interest of the students of the first category, by explaining them in detail the possible benefits of the training. The determination of the initial level of knowledge may lead to adjustment of the curriculum

planned at the beginning of training, and teaching methods (based on what the students already know). That said, the role of a teacher is changed: he/she is not just the carrier of ready answers to any questions, but an advisor and assistant in students' work on problems. His/her functions changed: now, a teacher must 'draw knowledge from the students, and establish the environment of cooperation at the training, which is more like a seminar than a lecture.

Thus, nowadays, there is an essential need (which is confirmed by both our and foreign practices of training) in activation of cognitive work of students, development of skills and abilities of analysis and estimation of a problem, and based on it, development of logic thinking, which helps shape a modern public health official as a person ready and able to implement modern innovative technologies in practical health system.

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Doppler researches informativeness in diagnosis of chronic viral hepatitises in children

Abstract: The data of 150 children after ultrasound examination are given in the article. Those were clinical laboratory results that not always reflect the real pathologic picture of hepatic processes with the divergence of 14%-37%. Additional doppler test in the combination with echography is shown to enable not only increase in diagnosing effectiveness up to 35,3%, but also in having in idea of the condition of parenchyma and spleen, collateral dysfunction of blood circulations and marked portal hypertension. Similar direction of structural functional impairments of hepatic vessels was determined. Direct and indirect criteria in diagnosing of portal hypertensions were worked out.

Keywords: chronic viral hepatitis, diagnostics, ultrasound, Doppler ultrasound, children.

Urgency. Chronic viral hepatitis (ChVH) presents severe problems for health services in most countries in the world and also in Uzbekistan. Due to its wide spread and the variety of forms as mild, severe, progressive and even cirrhosis [3, 5, 6, 7], the problem attracts particular attention in pediatrics and one of the causes is irregular sometimes wrong diagnostics of pathologic process in the liver. It is due to variety of clinical manifestations, similarity of symptoms of other gastrointestinal tract diseases, "scantiness" of objective signs, insufficient interpretation in literature on pediatrics matters of screening diagnostics, absence of conformity between pathology change in the liver and its manifestation [5, 8, 10, 11]. The main point of the development of chronic liver diseases is the development of the successive stages of fibrosis of the liver with cirrhosis at the end. The best standard diagnosing method in liver fibrosis is biopsy. However, the invasive method, possible errors in evaluation of the results with sampling error (incompatibility of local tissue area to the total process in the

liver) and practical limits in biopsy in children give rise to the study of other, more available methods in diagnostics.

The experience in pediatrics certifies the necessity of popularization and in all area inculcation of USI. The preferences given to ultrasound echography in the combination with dopplerography of the vessels in various systems. It is not only supplement to two dimension USI but enables to reveal delicate mechanism of hemodynamics disturbances in the cases not diagnosed by using the standard echography [1, 2, 9, 12]. At this point of view, the role of Doppler in complex evaluations of the conditions of the liver the ChVH in children is of great significance.

Purpose of the investigation: comparative evaluation of informatively of echography and hemodynamic disturbances in the hepatic vessels and spleen in children with ChVH.

Materials and methods.

150 children with ChVH at the age of 3–14 years old were under the investigation: 3–6 years old — 37,3% 7–14 years old — 62,7% with minimal activity — 30,3% (1st group), mild

activity — 30,3% (2nd group), marked activity — 30,3% (3rd group). Among them boys constituted 75%, girls — 25%. Remoteness of ChVH was $5,2 \pm 0,3$ years on average.

The diagnosing was made on the basis of clinical, biochemical, serologic, and instrumental data with the recommendation of B. F. Uchaykin and coauthors [5] and F. I. Inoyatova and coauthors [4].

Clinical tests of children included detailed collection of history data, clinical examination with totality of signs. Biochemical, blood test included determination of ALAT, ASAT activity, protein content and its fractions, general and direct bilirubin, alkaline phosphatase, Hama-GTP, thymol test, fibrinogen, prothrombin unified methods with the help of commercial set of "Optima" on biochemical analyzer ФП-901 with the use of "HUMEN" (Germany). Virology Verification HBV, HCV, HDV were carried out by ELISA and PCR with the use of sets "BCM" (Moscow).

Instrumental examination included through — skin echography of the liver, gall bladder and spleen and the vessels by standard methods [2], on Inter SCAN-250 (Germany). With electronic transducer working at 3,5–5 Mhz. Dopplerography was done on scanners working in real time scale with grey shades of SSD-630 "Aloka" (Japan) and "Sterling" Phillips (Holland) with convex sensors frequency from 2,55.0 Mhz in impulsive regimen. Hemodynamic indications of celiac trunk, general hepatic artery, splenic artery were taken into account.

Maximal or systolic rate (V_{max} in m/sec), minimal and final diastolic rate (V_{min} in m/sec), moderate value of maximal rate (TAMX in m/sec) which was determined by manual tracing of the curve of blood flow rate during three cardiac cycles, pulse, index (PI) equal to $V_{max} - V_{min} / TAMX$, resistance index (RI) equal to $V_{max} - V_{min} / V_{max}$ were measured.

Mathematical processing was done by statistics program "Statgraff" with determination $M \pm m$, t , statistic and graphic system "Diasta" to carry out variable statistics.

Results and discussions.

The results of investigations proved the idea of insufficient and various informatively of clinical biochemical data in diagnosing of pathological process in the liver with ChVH.

Severity of clinical syndromes as well as the level of hyperenzymemia, viral load not always correlated with pathologic process in the liver. The data of USI and DG of the liver enable to evaluate the conditions of the liver and spleen and appeared to be of big interest.

According to USI results in children with minimal activity of ChVH it was revealed that changes in most echographic sign of the liver/spleen were normal, but the walls of the gall bladder were found to be thickened (70,0%), echo heterogeneous content (34,0%), inflections in the bottom, body and/or neck (62,0%).

Echography of the liver and spleen and its comparison between the moderate and marked activity revealed similar direction of the changes with expressiveness in children with high activity of pathologic process. So, hepatomegaly with not

smooth borders, density of the capsule and high echogenicity of parenchyma was mostly noted in children of 3^d group ($p < 0.05$). Changes in parenchyma varied from moderate focal to large focal with different density structure in most patients (64%, $p < 0.01$). In that type of patients not clear vascular picture was noted two times more often, and in some cases (24%) were not visualized at all ($p < 0.01$). Most patients were noted to have increased portal vein diameter (62% and 74% correspondingly in 2nd x 3^d groups), where big sizes (> 12 m/m) prevailed in children with marked activity (40% against 18%, $p < 0.01$). The signs of portal hypertension were accompanied by the disturbance in the walls as density, thickening winding with areas of deformity of vessel cavity. Echo picture of the gallbladder didn't differ, thickening of the walls with "doubled outline", heterogeneous content, inflections in the area of the body bottom and or the neck were the characteristic changes. Also they were noted in ultrasound data of the spleen, where marked active form of the spleen acquired spherical shapes by rounded edges (56%) with increased echogenicity and dense parenchyma (100%), and also by large (> 7 m/m) diameter of splenic vein (66,6%, $p < 0,01$). Disturbances of the splenic vein wall were visualized by the density and winding of the vessel at gate of a spleen of and gleam thinning of the vessels in the parenchyma of the organ.

The analyzing of the hemodynamic disturbances in the hepatic vessels and the spleen in children showed the sensitivity of the method in severity evaluation of pathologic process in the liver to be higher than in other clinical laboratory methods, including USI. Mean while all parameters differed from the those in healthy children ($p < 0.01$).

In children of pre-school age with minimal activity of ChVH reliable hemodynamic disturbances were observed in celiac trunk in parameters V_{max} in decrease of linear rate of blood flow ($1,75 \pm 0,08$ m/sek), PI and RI — increase of resistance indexes (to $1,15 \pm 0,02$ and $0,61 \pm 0,01$ correspondingly) and V_{vol} decrease of the volume blood flow (to $118,1 \pm 0,11$ $p < 0,05$). In the group of moderate activity some tendency ($p < 0,05$) was seen.

In severe activity deviations in celiac trunk data were more intensive; deviations in TAMX and V_{min} ($p < 0.01$) parameters were revealed additionally. The analysis of blood flow in general hepatic artery revealed some direction in deviations; the difference was in earlier changes with minimal activity of moderate value of maximal rate (decrease of TAMX) as well as final diastolic rate (decrease of V_{min}) in narrowing of the diameter of the vessel (to 0,36 m/m).

As for splenic artery, the some patterns with more intensive shifts covering all the parameters were noted children with severe activity of ChVH ($p < 0.01$). The picture certifies the severity of the vascular pathologic changes in blood flow, the intensity of which rose by the pathologic development in the liver.

Similar deviations in hemodynamics were revealed in school children. Only RI increase and V_{min} decrease in splenic artery at minimal activity of ChVH ($p > 0.05$) can be noted.

This, evidently, proved compensatory possibility of liver hemodynamics.

Thus, the changes in the resistance and blood flow rate testified the increase of vascular tone, the possibility of vascular spasm as a result of vascular wall damages, early or acute signs of syndrome of portal hypertension.

On individual evaluation, the disturbances revealed in vascular flow enabled early stages of portal hypertension diagnosing. According to the data of gray scale USI the portal hypertension was observed in 58% of patients but the doppler test presents it in 93,3% of cases ($p < 0.01$).

On the basis of dopplerography a number of patients were transformed to the related group and it was significant for further doctor's tactics: 14% with minimal activity were referred to the group of moderate activity; 26% with moderate activity were transferred to severe one, and 37,0% of children with severe deviations composed a group with a risk of cirrhosis of the liver.

Results of the research enabled to detect the direct and indirect ultrasound signs to observe latent and clear changes in the liver spleen also, to determine the signs of portal hypertension.

Chief symptoms are: splenomegaly, dilatation of vein in portal system (more than 9 m/m) and splenic artery (more than 7 m/m), decrease in linear rates of blood flow (V_{min} , V_{max} , TAMX), increase resistance indexes. (PI and RI), decrease of V_{vol} in all arteries seen in the research. Totality of three or more signs certifies the development of portal hypertension and possible cirrhosis.

Indirect signs: density of the hepatic capsule, unevenness of the borders, winding direction of intrahepatic vessels, presence of numerous with different density foci of the density.

These signs showed highly specific features — 66% and reflected the processes of fibrous and regeneration of parenchyma of the liver.

Conclusion.

Ultrasound examination of the children and clinical laboratory findings not always reflect the real picture of pathologic process in the liver, where the divergence may vary in the ranges of 14%-37%. Additional apply of dopplerography in the combination of echography makes possible not only to increase the effectiveness of diagnostics to 32,3% but also to see clearer the condition, collateral disturbances in blood circulation and severity of portal hypertension direct and indirect criteria of pathology changes in the liver should be taken into account. No matter the age is the direction of the disturbances in hemodynamics has some tendency in deviations at all parameters: and resistant index (PI) in general hepatic artery, PI and RI indexes of resistance in splenic artery could be noted. Rise in indexes data with decrease of blood flow volume rate in the arteries proves the presence of deep structural functional disturbances in the hepatic vessels which are caused by severeness of morphologic changes in the affected organ. Thus, dopplerography is a valuable method of examination of children with ChVH, which gives the possibility in diagnostic and prognosing ways of clinical specialists as addition to diagnostic complex that timely reveals latent and marked form of portal hypertension, assess the activity of pathologic process in the liver based on hemodynamic disturbances in visceral vessels, administrate specialized medical help.

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Timing of diagnosis of central nervous system neoplasms in Stavropol Krai based on Stavropol Krai Clinical Hospital database

Abstract: Neoplasm of the nervous system is analyzed in order to clarify the timing of diagnosis of the most common tumors in this location in Stavropol Krai.

Keywords: neoplasm, nervous system, metastases of tumors.

Background and aim

Neoplasm of the nervous system is a serious health problem throughout the world and in Russia in particular. Primary tumors of the central nervous system account for about 1.5% of all cancers. In absolute values the incidence increases with age. Brain tumors account for 85–90% of all tumors of the central nervous system (Levin V. A., Leibel S. A., Gutin P. H., 2001). According to estimates from the National Cancer Institute, there are over 22,000 new cases of brain cancer and about 13,000 brain cancer deaths each year in the United States, with an annual incidence and mortality rates (per 100,000 population) being 6.6 and 4.7, respectively. In Russia the rates are lower and account for 4.9 and 4.6 per 100,000 population, respectively (Chissoy V. I., Starinskiy V. V., Petrova G. V., 2011). The early diagnosis of tumors is essential in the case of a CNS lesions. The review of the available scientific literature revealed that there are no accurate data on the timing of diagnosis of central nervous system tumors from the onset of symptoms to the diagnosis. The duration of the neurological deficit affects the quality of life in patients with tumors of the nervous system and is the most important medical and social problem of modern neuro-oncology, because the disease usually has a progressive course, leads to a life limitation, disability and very often to death (Gorbunova E. V., 2011, Parkin DM, Bray F, Ferlay J, 2010) [17, 1–2]. The speed of providing a specialized neurosurgical care depends on the speed of the detection of CNS space-occupying lesions, which requires the improvement in the timing of CNS tumors diagnosis and treatment.

The aim of the study is to specify the dates of central nervous system neoplasms diagnosis on the basis of the data obtained in the neurosurgery department of the Stavropol Krai Clinical Hospital (SKCH) in 2013.

Materials and Methods

We performed a retrospective analysis of 327 medical records of hospitalized patients in SKCH neurosurgical department to identify the timing of the diagnosis of CNS neoplasms in 2013. The results obtained are processed in Excel and IBM SPSS Statistics.

Results and Discussion

The study considers patients with the confirmed diagnosis of CNS space-occupying lesions. In 2013 327 patients with neoplastic processes in the CNS were hospitalized in SKCH neurosurgical department. Out of all the cases registered, 144 (44%) were males and 183 (56%) — females, including children — 22 (6.7%). The median age of patients was $49,6 \pm 16,2$ years.

All medical records were grouped in accordance with the WHO classification of tumors of the CNS types and the classification of tumors in terms of morphological structure.

We identified 73 (22.3%) cases of meningiomas in different areas. Meningiomas account for 14,3–19% of all primary intracranial tumors [10, 440]. The study showed that the mean time to diagnosis of meningiomas was 11 months.

In one case, meningioma in temporoparietal area was diagnosed incidentally in a patient without neurological deficit. The patient was hospitalized and had a planned surgery within 1 week period. In two other cases, meningiomas in cerebellopontine angle manifested with dizziness and a slowly progressive hearing loss, due to which the time from the onset of neurological deficit to the diagnosis was 6 years.

The study revealed metastases of tumors in other CNS areas in 51 (15.6%) patients. The average time to metastasis diagnosis was 3 month. Metastatic CNS tumors (predominantly in the brain) develop in 10–30% of patients with malignant tumors of other organs and tissues. The occurrence of CNS metastases should be most expected in patients younger than 35 years old with encephalophilic tumors: small cell lung cancer, breast cancer, testicular cancer, melanomas [6, 25–29]. The selected group included 19 (37.3%) cases of metastases of lung cancer in the nervous system, 6 (11.8%) cases of breast cancer, 5 (9.8%) cases of kidney cancer and 4 (7.8%) cases of melanoma.

20 (6.1%) patients were hospitalized for pituitary adenomas. Up to 95% of pituitary tumors are benign and relatively slow-growing ones (Gaidar B. V. et al. 2002, Renehan A. G. et al. 2000). Pituitary tumors clinically manifest with endocrine disorders or mass effect. In most cases the mean time to diagnosis of pituitary adenoma was 18 months. In one case,

the period of diagnosis was 1 week (patient complained of eyelid ptosis and amblyopia). In another clinical case the diagnosis delay was 7 years (major symptom in this case was acromegaly).

Glial tumors predominantly in cerebral hemispheres were diagnosed in 27 patients (8.3%). These tumors are more common in younger patients and children and are often diagnosed based on the presence of seizures [10, 423]. The mean time to diagnosis was 6 months. In 4 (15%) patients with astrocytoma, located in the frontal lobe of the cerebral hemispheres was clinically accompanied by epileptic seizures, the differential diagnosis of which was based on a computed tomography performed in a short time. The frontal lobe space-occupying lesion was diagnosed on CT findings. The maximum period of glial tumors diagnosis was 5 years (in this clinical case, the patient complained only of a headache, which has long been associated with concomitant hypertension and treated with antihypertensive drugs before the onset of neurological deficit in the form of unsteadiness of gait caused by cerebellar hemisphere glioblastoma).

We found 9 (2.9%) cases of vascular tumors, mainly in the spinal cord. The average time to diagnosis was 1.3 years. Spinal cord angioma manifested with disorders of surface sensitivity (paresthesia, causalgia).

It took the hospital about 7 months to diagnose neuroomas — 6 (1.8%) — of the cochlear nerve and cauda equina. Tumors manifested with progressive hearing loss, headache, dizziness, ataxia (in the case of destruction of the cochlear nerve), and radicular pain associated with lesions of the cauda equina.

CNS cysts, mostly localized to the cerebral hemispheres (75%), were found in 4 (1.2%) patients. The mean time to diagnosis of cysts was 10 months. The prevalent clinical manifestations included cerebral symptoms such as headaches and dizziness.

In 4 (1.2%) cases the medulloblastoma of the cerebellum was detected, with manifestations including ataxia, dizziness, vomiting, and headache. The mean time from the onset of symptoms to the diagnosis was 2.3 months.

Craniopharyngioma in suprasellar region was diagnosed in 3 (0.9%) patients within 1.6 years. Clinical manifestations included hemianopsia, amblyopia, nausea and vomiting. It has been observed that patients with this diagnosis had been on surgical treatment at an eye clinic for some time without recourse symptoms after treatment.

Diagnosis of angioreticuloma in different locations was found in 3 patients (0.9%) and took 10 months. Complaints included severe headache and in one case, cerebellar ataxia with cerebellar hemisphere lesion.

Diagnosis of neurofibromatosis — 3 (0.9%) cases — took an average of 4 years. In one clinical case it was diagnosed within 2 weeks (patient's overall well-being was accompanied with ataxia, unbearable headache, dizziness, nausea and vomiting that made the patient immediately seek medical help).

Meningeal carcinomatosis was diagnosed in 1 (0.3%) case. The patient complained of convergent strabismus, diplopia and headache. The diagnosis was made within 1 week.

In 1 (0.3%) case of parietal lobe ependymoma neurological deficit manifested with hemiparesis. The diagnosis was made within 3 months.

116 people (35.5%) were hospitalized with a general diagnosis of "central nervous system tumors of different locations".

In this diverse group total period of diagnosis of CNS tumors was about 6 months. We have noted that many patients complained of cerebral signs and symptoms in the form of headaches, dizziness and nausea, but the fact of seeking medical care was associated with the appearance of focal symptoms indicating the level of the CNS damage.

Conclusions

1. Timing of CNS neoplasms diagnosis directly depends on the severity of neurological deficit and its growth rate.

2. The average time to diagnosis of CNS neoplasms in the Stavropol region was 8 months, tumors types not being taken into account.

3. The most common sources of nervous system metastases are lung cancer, breast cancer and kidney cancer, which suggests that some of these tumors are encephalophilic.

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Features of debut of pediatric multiple sclerosis

Abstract: This article is devoted to study of children's multiple sclerosis (MS), which is an urgent problem of modern medicine. In recent years MS incidence among children increased significantly all over the world including Russia. A lot of causes of MS remain unexplored but there already have been done a great breakthrough in discovery of pathogenic mechanisms of development of inflammatory and destructive process.

Keywords: multiple sclerosis, children.

Topicality: Until recent time multiple sclerosis was considered to be an adult disease only. But now it is established that in last decades children's cases of the disease are being recorded more often; moreover, in recent years the incidence of MS has increased significantly all over the world and, particularly, in Russia.

Purpose of the article: Analysis of the debut of multiple sclerosis in children.

Results: Due to the fact, that in childhood multiple sclerosis is usually monosemiotic, diagnosis is significantly

complicated. After long attack comes long remission, that's why diagnosis is mostly retrospective, when there is aggravation of multifocal lesions of the nervous system. Among the risk factors of MS in children a special attention is paid to structural changes in the white matter of the brain, that are found in newborns with hypoxic encephalopathy [6]. By the age of six months the amount of healthy children's antibody titers is almost equal to normal limit of adults, and, at the same time, 12% of 2–3 year children are being identified

to have antibody titers to galactocerebroside, and the amount of which 2 times exceeds an adults' usual amount of titers [7]. It's already known that the level of antibody production to glutamate receptors is also dependent on the age. In some children those titers remain for a long time. It must be emphasized that increased titers of antibodies to galactocerebroside, which are contained in the myelin membranes and cells myelin-producing cells, and to glutamate receptors, which activate neurotransmitter nitrogen oxide production, having a direct toxic effect on oligodendrocytes, create background for the development of demyelinating process in the central nervous system. Debut of MS at the age of 10 years implies

a more favorable course of the disease, whereas the debut at the age of 12–14 characterized by severe course with frequent exacerbations [8].

Summary: The question about the prognosis of multiple sclerosis, which debut in childhood remains unsolved. There are a lot of cases of benign and malignant course of MS in children. Taking into consideration the difficulty of clinical diagnosis of MS in childhood, only complex approach using modern methods of examination allows making an early diagnosis and appropriate treatment, provide an important adherence which is essential to prevent progression of disease and deterioration of the patient.

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A state of visual analyzer according to the reverse color chees type pattern in case of patients with type 1 diabetes

Abstract: The visual analyzer with an evaluation of its functional state at the time of the pulse and the response of the cortical structures presented stimuli. Results of the study revealed that diabetes mellitus in the structures of the visual analyzer significantly ($p < 0,01$) increased in the latent period of the colored stimulus, relative to the control group and the performance of black and white pattern.

Keywords: diabetes, evoked potentials, visual analyzer.

Introduction

Among the pathological conditions of the nervous system, resulting in diseases of the endocrine glands, a special place is occupied by neurological disorders in diabetes mellitus (DM) [1]. This is due not only to the prevalence of these disorders, but their severity, a significant influence on the

prognosis and quality of life. DM is one of the most common diseases in the world. According to experts, by 2025 the total number of people with diabetes will reach 324 million people [3; 7; 11]. Currently, in Russia, about 8 million people suffer from diabetes and the number is constantly growing. [11] Despite the fact that the proportion of type 1 diabetes from

all forms of diabetes is not more than 10-15% [3], this form is the most important medical and social problem of public health, as this disease often occurs in childhood and adolescence, characterized by severity, early disability and often fatal consequences [1; 4; 11].

Vascular lesions are observed in all forms of diabetes. However, the effect of high levels of disabilities in type 1 diabetes comes from exactly microangiopathy, which lead to diabetic retinopathy (DR) [6; 8]. It is noted that diabetes is one of the first places to cause blindness and visual impairment in all age groups. The risk of blindness in patients with diabetes is 25 times higher than in people without diabetes [9; 11; 12]. In this regard, the study of the state of the entire path of the visual analyzer with type 1 diabetes is of particular importance.

The purpose of the study: to study the neurophysiological state of the visual analyzer pathways in patients with type 1 diabetes, according to the black-and-white or color stimulus.

Materials and methods

A comprehensive clinical and physical examination in 81 patients with type 1 diabetes mellitus (33 men, 48 women) diagnosed with type 1 diabetes who were treated at the Clinical Hospital №3 at the endocrinology department of Stavropol. The average age of the patients was $25,3 \pm 4,5$ years. The duration of the disease ranged from 1 year to 10 years, and averaged $7,1 \pm 1,4$ years.

Most of the patients studied were in a state of relative compensation of DM. Clinical state of the visual analyzer in patients studied in conjunction with an ophthalmologist. The criterion for the possibility of the study was the presence of type 1 diabetes with the initial stage of diabetic retinopathy or without marked changes in the fundus. Of the patients studied, persons with anisometropia, myopia greater than 1.0 diopters, astigmatism, amblyopia, exophoria, color anomalies, any other (except for diabetic retinopathy) eye diseases or injuries to anyone not previously held photo laser coagulation were excluded.

To evaluate the visual analyzer, neurophysiological studies were conducted on the device "Neuron-Spectrum-4 / EPM" produced by "Neurosoft" with computer processing, developed at the Academy of the Russian Federation, Ivanovo MTN. Studied the latent period (LP) and the amplitude of the response induced by visual potentials (CDW) on a reverse black and white (B&W), red-yellow (QOL) and green-black (AF), chess pattern (SHP). The advantage of this study is the most accurate selection in a graphical display of the main P100 wave, which corresponds to the activation of the 17th (primary visual cortex) and 18 (visual association cortex) field by Brodmann [2, 11]. The method allows to trace the nerve impulse along the optic fibers from the cells of the retina (rods and cones, dipolar and ganglion cells) further along the optic nerve, through the optic tract and the structure of the mid-brain to the occipital lobe of the cerebral cortex [2], making it possible to quantify conduction velocity on the visual analyzer on black-and-white and color spectrum of visible light. The study was conducted according to standard procedure.

The active electrode was placed over the occipital region

in lead O2 O1 international scheme "10-20%" and the ground electrode in the frontal region (at Frz). Ipsilateral electrode was placed at Cz. The impedance at the electrodes is less than 5 ohms, the cell size is 49'. Stimulation was carried out on alternate black and white and colored checkerboard pattern, alternating on the left and right eye in a darkened room with a pre-adaptation in the sitting position for one study. Evaluated the response components N75, P100 and N145 ms. Mainly emphasized the study of the main component and P100 wave amplitude N75-P100. All studies were conducted prior to the baseline treatment. Comparative analysis of the results was carried out with a group of 15 healthy subjects, a statistically homogeneous by sex and age.

All the patients were conducted clinical and laboratory examination, including determination of antibodies to myelin basic protein (MBP), which were determined by enzyme immunoassay analysis, using reagent kit developed by Yastrebova N.E. and Benaiah N.P. (firm "Navi", Moscow) [5].

For the analysis, the results were obtained by using the arithmetic mean values (M) and their errors (m), standard deviation (δ). Significance of differences of mean values was evaluated using Student's t test (t).

Results and discussion

Clinical examination in 18 (58.1%) patients were diagnosed as diabetic encephalopathy, which is a manifestation of the complaints were asthenic character: general weakness, fatigue, decreased performance, anxiety, emotional lability, impaired concentration, memory loss. In 67.7% of cases detected cephalgic syndrome. It should be noted that the headache often had the character of a compression compresses the type of "close headdress."

Distal symmetric polyneuropathy met in 28 (90.3%) patients. Thus the patients were affected by tingling, numbness, coldness of feet and rarely brushes or burning sensation, pain in the extremities, which is often amplified at night or at rest. The patients showed a reduction of pain, temperature or vibration sensitivity of the type "socks" and "gloves", reduced reflexes, tone, in some cases moderate motor impairment. Hypaesthesia gradually spread from the distal portions of the legs and arms to the proximal. In 11 (35.5%) patients had depressive changes of varying severity as a consequence of the disease. In all cases, the patients reported a syndrome of vegetative dystonia in the form of diffuse dermatographism, diffuse hyperhidrosis, acrocyanosis. In 3 cases, the patients reported the development of presyncope. In 5 (16.1%) cases, the patient developed vegetative trophic disorders in the form of arthropathy manifesting progressive deformity of the ankle and foot joints as a result of defeat of autonomic fibers.

To clarify, the extent of damage of the peripheral nervous system and in particular the visual analyzer were used indicators of evoked potentials. For this, we used the method of visual EP brain, allowing it to objectively assess the state of the conduction system of the visual analyzer of the retina to the cortex. Functional state of visual-neural pathways in patients

with type 1 diabetes was investigated by VIZ alternated on a chess pattern. VEP are electrical signals generated neurons in the brain in response to a pulsed-light stimulation of photoreceptors of the eye. We investigated the degree of impair-

ment of the optical paths of conduction in patients with type 1 diabetes without diabetic retinopathy (DR).

Conducted neurophysiological examination revealed several patterns. The results are shown in Table 1.

Table 1. – CDW dynamics of quantitative indicators in patients with type 1 diabetes on a black and white checkerboard pattern (M±m)

Period	CA 1 Type (n=36) Before treatment	Controlled Group(n=15)
Latency period (ms)		
N75	76,1±2,81	72,1±2,09
P100	109,3±2,78	103,1±1,72
N145	164,2±2,49	151,3±2,22
Amplitude (mV) P100	4,3±1,63	8,1±1,21

Note.* – Significant differences ($r < 0,05$) - the control group.

After analyzing the results of the VEP on black-white Silk P100 wave was found that in patients with type 1 diabetes observed a moderate increase in the PL right and left, which amounted 109,3±2,78 ms (control group 103,1±1,72 ms).

Significant changes in P100 wave were not found. Results of the study indicate that the elongation LP P100 wave was observed in 87.1% of cases. Graphically, this is shown in Figure 1.

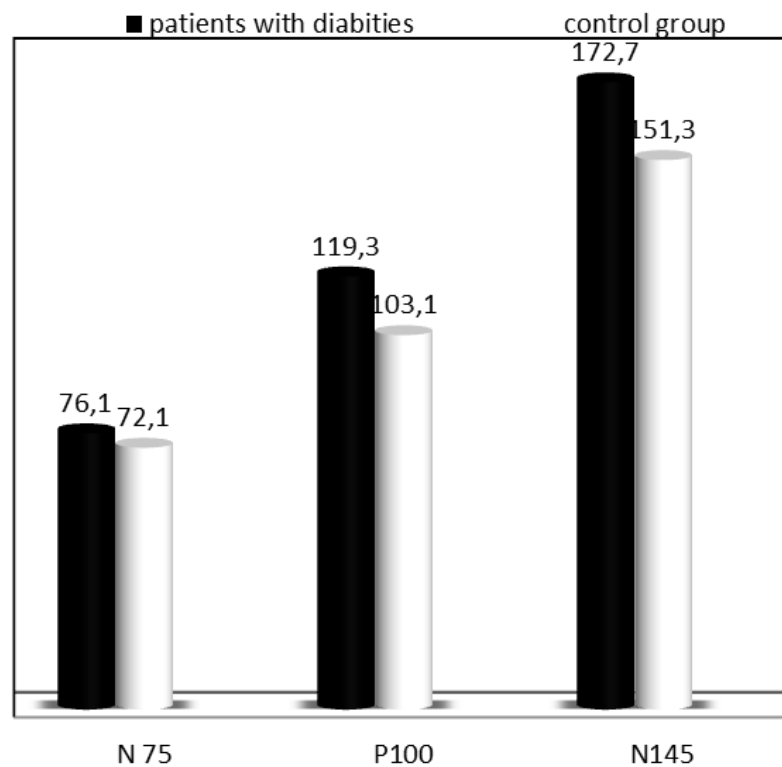


Fig. 1. Indicators of VEP components on a black and white WS relative to the control group (in ms).

Another important patterns at SGP on BW Silk was a reduction of the wave amplitude N75-P100, where the amplitude component analysis allowed the note split wave crest in a third of cases. For the patients who examined wave amplitude N75-P100 amounted 4,3±1,63 mV, Indicating a state of “depression,” the response of visual neurons.

The greatest research interest is the analysis of the results obtained in the colored checkerboard pattern alternated. In the second trial, the color red (with wavelength range 625-740 nm) was substituted with a yellow color (with the wavelength range 565-590 nm). The studies revealed significant

changes both in terms of LP and amplitude response. This is shown graphically in Figure 2. It has been found that red-yellow WS (box 49 ‘) showed ($r < 0,01$) a significant increase in PL P100 wave in all the samples relative to the control group and the right and left was 143.2 ±3,38 ms (control 109,8±2,87 ms). Credible ($r < 0,01$) changes in terms of the LP were identified late EP components. Since PL wave N145 was 185,2±3,97 ms (control 149,4±2,79 ms). We noted that only three (11.5%) cases PL P100 wave was slightly above test results, however, exceeding the value of the control group.

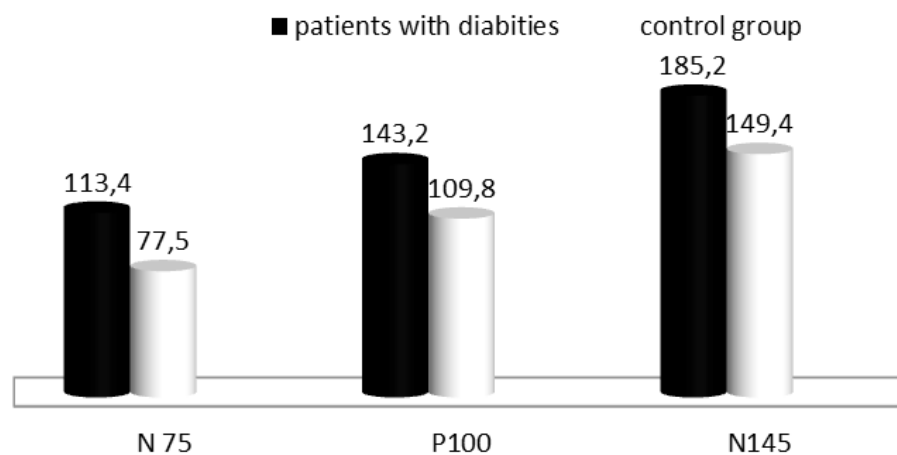


Fig. 2. Indicators of VEP components on a red-yellow reversible WS relative to the control group (in ms).

Analysis of the wave amplitude N75-P100 showed on red-yellow Silk shows that patients with type 1 diabetes as well noted significant ($p < 0,05$) decrease in the amplitude response to a stimulus that was $2,2 \pm 1,79$ uV.

Results for green and black reversible WS where pulsed effect was sent to the mono color mode only visible light on

the system of cells (cone) (Green - wavelength range 500-565 nm). According to this test PEL on the green there was a significant ($p < 0,05$) increase in PL, which is to a wavelength P100 - $139,3 \pm 3,78$ (control group $107,3 \pm 2,82$ ms). Indicators LP wave N145 just had significant changes. The results are shown in Figure 3.

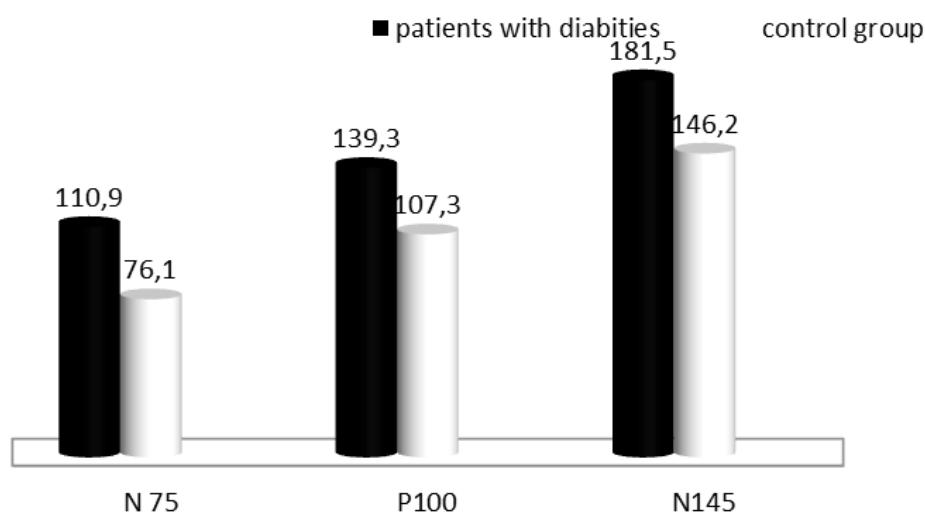


Fig. 3. Indicators of VEP components to green - black reversible WS relative to the control group (in ms).

In this sample on the green wave amplitude N75-P100 was significantly reduced. According to the studied patients wave amplitude N75- P100 amounted $3,21 \pm 2,14$ mV. The study results suggest that the decrease in the amplitude of the response on the results of CDW in different light wavelength range associated with reduced impulse flow along the fibers of the visual analyzer and the consequent decrease in the number of neurons that activate the response of the bark on the presented stimuli. Taking into account the obtained results, we believe that the increase in the PL on the visual analyzer in patients with type 1 diabetes is the result of processes of demyelination. In this context, to clarify these particular mechanisms, we performed immunological studies related to the specification of the concentration of antibodies Ig G to myelin basic protein, as a manifestation of chronic immunological reaction. During the study of 19 patients with type 1 diabetes was found that the concentration levels of IgG antibodies to MBP in patients with diabetes was significantly ($p < 0,001$)

higher than the control group and put together amounted the treatment group as $188,6 \pm 4,1$ g / ml. (Control group $50,1 \pm 2,12$ g / ml). It should be noted that raising of antibodies to MBP was detected in all cases.

Conclusion

Thus, the neurophysiological and immunological results indicate that the type 1 diabetes demyelination processes occur in the structures of the visual analyzer, which help to reduce the conductivity of the "flow" of visual momentum in cortical structures of the visual analyzer. These changes lead to a decrease in the response of cortical reaction presenting stimulus mainly in the visible color spectrum of visible light. The study results in the early stages of type 1 diabetes to identify the pathology of the visual analyzer, before the appearance of clinically significant symptoms. This method can be used in the diagnosis of early manifestations of the pathology of the visual analyzer in the cases when patients are diagnosed with type 1 diabetes.

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Contemporary approaches to the trigeminal neuralgia therapeutic management

Abstract: Trigeminal neuralgia is one of the most widespread cases of prosopalgia characterized by a high intensiveness of pain attacks as well as by an exclusive resistance to different therapeutic methods. [2, 39–41; 3, 326–329]. Specific paroxysmal character of pain attacks in trigeminal neuralgia defines its therapy techniques. The first medication which gave a significant effect in the therapy of trigeminal neuralgia was Dilantin. Blom in 1973 was the first who used anticonvulsants for pain management (Finlepsin, Carbamazepine).

Keywords: Trigeminal neuralgia, paroxysmal pain, treatment, anticonvulsants.

Purpose of research: to analyze contemporary methods of the trigeminal neuralgia treatment.

Materials and methods: analyze of contemporary literature concerning the basic approaches to the trigeminal neuralgia treatment.

Results of research: Specific paroxysmal character of pain attacks in trigeminal neuralgia defines its therapy techniques. The first medication which gave a significant effect in the therapy of trigeminal neuralgia was Dilantin. Positive results were achieved by a combination of Dilantin with Am-

inazin (L. G. Erochin, 1973). Blom in 1973 was the first who used anticonvulsants for pain management (Finlepsin, Carbamazepine).

The review of numerous researches about Carbamazepine makes clear the fact that 70–90% of patients had a significant positive effect after the first intake of this drug (B. A. Karlov and O. N. Savitskaya, 1980, V. A. Smirnov and others, 1968, Blom, 1963). However a long-term medication of trigeminal neuralgia by Carbamazepine leads to a gradual reduction of its analgesic effect owing to the drug tolerance elaboration (Hop-pere R., 1980). That's why a NTN medications pharmacokinetic study is especially topical.

The main aim of treatment of trigeminal neuralgia is an eradication of a pain's reason (bad tooth, inflammation process in adjacent zones etc) and definition of a symptomatic therapy (pain management, restoration of the nerve's functions and structure).

According to the recommendations for the NTN pain control by the European Federation of Neurological Societies (2009) the first line medications are Carbamazepine in a dose of 200–1200 mg/day and Oxcarbazepine 600–1800 mg/d. Example of a medication schema: 2 days a patient intakes ½ t (100 mg) 3 times a day, daily dose 300 mg; then 2 days 1 t (200 mg) 2 times a day (daily dose 400 mg); then 2 days 1 tablet (200 mg) 3 times a day (daily dose 600 mg). The effect must be felt within 48 hours. In the case of failure a dose can be increased up to 1200 mg. Medication by Carbamazepine should be started by 50 mg per day and increased up to 600–800 mg, and in 3–4 weeks daily dose must be significantly reduced to a maintenance dose. The medications of the second line are Lamotrigine (400 mg/day) and Baclofen (40–80 mg/day). There are researches describing the effectiveness of Phenytoin, Gabapentin, Clonazepam, Valproate. Such a therapy is especially effective with a classic (idiopathic) NTN [9, 30–32; 10, 306].

NSAIDs are frequently used for trigeminal neuralgia treatment: Xefocam (Lornoxicam) producing a well expressed analgesic and anti-inflammatory effect. Xefocam is especially effective with a NTN of peripheral genesis [10, 306].

Besides anticonvulsant, antidepressant and NSAID, neuro-metabolic medications, antioxidant, antihypoxants (Actovegin) can be also rationally administrated. Researches of several authors prove that usage of neuro-metabolic drugs favors normalization of metabolic processes in trigeminal nerve system, eradication of trigger points and prevention of pain attacks. B vitamins are also used for treatment of trigeminal nerve neuralgia; they produce a neurotropic action, analgesic effect, and nerve regeneration capacity. Maximal effect of B vitamins can be reached by an intake of multivitamin complexes (Neurobion). Its effectiveness is explained by a cumulative, antinociceptive and neurotropic action of all components. It favors with inhibition of nociceptive impulsation and with positive influence on axons and TN medullary sheath regeneration processes. Nerve reconstruction leads to a coherent passage of afferent impulses and normalization of cerebro-

spinal nucleus's gelatinous substance activation, which blocks a portal for a pain impulsation flow.

Physiotherapeutic procedures are also used for NTN treatment: electrophoresis, phonophoresis, amplimpulse on trigger zones, as well as laserotherapy.

In the case of failure of the above-listed measures a surgical operation can be recommended (Sano K. 1987) [8]. Nowadays the following operations are performed (E. I. Kandel, 1981):

- 1) Operation (transaction, decompression, electro stimulation) on trigeminal ganglion and sensory root of trigeminal nerve;
- 2) Transaction of a TN conduction tract and its sensor nuclei in medulla, at the level of thalamus and pain-conducting way from thalamus to cerebral cortex;
- 3) Operation (transaction, alcohol block) on the three branches of trigeminal nerve.

The most effective surgical method of trigeminal neuralgia treatment is percutaneous stereotaxic destruction of trigeminal ganglion elaborated by Sweet, Wepsic, (1978) Siegfried (1977). Chemical and hydrothermal rhizotomies are effective and are rarely followed by remissions. (L. Y. Livshits, 1965; A. A. Choudnovsky, 1983), but sometimes they provoke a total prolapse of trigeminal nerve functions and lesion of adjacent visceral-nervous units. For the elimination of these complications Sweet and Wepslo 1978, elaborated a method of selective destruction of pain-conducting fibers of a trigeminal nerve's root [10, 306].

Among the surgical methods a microvascular decompression proposed by P. Jannetta (1977) found a large application scope. The operation consists of trepanation of posterior cranial fossa, revision of interrelations between the TN root, upper cerebellar (rarely of the anterior inferior cerebellar) artery and superior petrosal vein. In the case of compression of the root by vessels the last ones must be separated and drawn aside. Synthetic pad is placed between the root and the vessels (Pand R. W., 1982; Pollaek I. F., 1988). The average effectiveness of such operation is 77,5%.

Despite the encouraging results of surgical methods, the problem of remissions exists. That's why elaboration of new methods of trigeminal neuralgia treatment and definition of strict surgery indications is still acute.

Afanassieva E. V. proposed a schema of conservative treatment of patients diagnosed with trigeminal neuralgia, who can't undergo the operation of microvascular decompression because of somatic contraindications. The treatment is aimed at the reduction of nociceptive impact of pulse strokes on the root. The schema is the following: blocking with Kenalog, Lidocaine and Vitamin B12, in the region of peripheral nidus of dymyelination, perineurally: with neuralgia of the third branch — near the oval foramen, in the case of neuralgia of the second branch — in the region of pterygopalatine fossa. 3–5 blockings every second day are necessary. Besides this, drugs for the remyelination of the trigeminal nerve are administrated: Lipoic acid (Tiocetide, Berlitione), B-vitamins (Milgamma Neuromultiv-

it). For the increase of distance between the compressing artery and the root of trigeminal nerve at the expense of its volume — diuretics (Glycerin 0,5–0,8 g/kg) are prescribed under hematocrit guidance. So 37 patients were examined according to this schema. 27 of them 78% had a long-lasting remission. 8 of them had a pain of a very high intensiveness according to the visual analogue scale which was appreciated as a moderate pain after treatment. Remission of pain syndrome after the conservative therapy in 5 cases lead to a microvascular decompression in 3, 6, 18, 22, 24 months. Taking into account that the majority of patients suffering from trigeminal neuralgia are elderly persons — pathogenetic treatment is more relevant for them. In contrast to surgical interventions a conservative therapy excludes the development of deafferentation syndrome which are quite as much afflicting for them as trigeminal neuralgia [1, 24–26].

Researches of the authors (Karpov S.M., Christoforand D.Y., Baturin V.A., Karpov A.S. 2013) make a proposition that a pain syndrome in NTN is a consequence of autoimmune processes of trigeminal nerve structures, provoked by anamnestic catarrhal infections, as well as inflammation reactions after dental operations. These facts result in rising antibody titer to the myelin basic protein, inducing a process of demyelization. In this regard a therapy with Glucocorticoides (Metypred) was proposed to block the autoimmune aggression for an improvement of neurotrophic processes — Tyogamma, Neuromultivit. Research data confirmed that these drugs not only reduce pain sensations but also decrease the processes of demyelination and lead to a restoration of nerve structures resulting in a long-term remission [3, 326–329; 7, 16–19].

In the researches dedicated to botulinum toxin type A in treatment of trigeminal neuralgia undertaken in New York Center for Voice and Swallowing Disorders, St Luke's-Roosevelt Hospital, New York, U.S.A., Guardiani E., Sadoughi B, Blitzer A., Sirois D. (2013), in the most part of patients undergoing the intracutaneous and subcutaneous infusions is shown its effectiveness. The most common side effect was facial nerve paresis. So the botulinum toxin type A injections offer a safe, effective local treatment of trigeminal neuralgia. This method can be an alternative one in patients with intolerance or irresponsiveness to pharmacological medication of the first line [16, 413–417].

The researches undertaken by Arai YC, Hatakeyama N, M Nishihara, Ikeuchi M, Kurisuno M, Ikemoto T. studying trigeminal neuralgia demonstrate the effectiveness in a great part of patients of treatment by Carbamazepine, Gabapentine and Pregabalin separately or in combination. However several patients don't feel any improvement or suffer from pronounced.

Conclusion: The analysis of Russian and foreign literature brings us to the point that the trigeminal nerve neuralgia is provoked by reasons, mechanisms of occurrence and development of pain syndrome of different character. At the contemporary stage of neurology from scientific and from practical point of view the problem of trigeminal nerve neuralgia remains discussable and acute especially if considering the nondecreasing specific weight of the disease, complicity of its pathogenesis, low effectiveness of therapy and absence of efficient recommendations in the therapeutic management of this pathology.

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Status indicators of t-cell immunity in hiv-infected persons and patients co-infected with HIV/HCV

Abstract: Features of T-cell immunity have been studied in HIV-infected patients (n=30) and in HIV-infected patients with chronic hepatitis C (n=30). As a control were healthy donors (n=32). In HIV-infected patients found significant decrease in CD4+ and CD45+ T lymphocytes and an increase in the relative and absolute number of CD3+ T lymphocytes. Patients with co-infection HIV/HCV established a significant reduction in the absolute content of CD4+ (p<0,001), CD45+ (p<0,01), and the relative content of CD4+ (p 0,001), CD45+ (p<0,001), as well as the increase in the absolute number of CD3+ (p<0,05) T lymphocytes. Layering HCV for HIV-infection largely worsens the condition of T-cell immunity, causing deep its deficit compensation.

Keywords: HIV-infection, co-infection HIV/HCV, T-cell immunity.

Hepatitis C virus (HCV) and human immunodeficiency virus (HIV) are characterized by their wide distribution and ability to cause health disorders of the working population, thus causing significant morbidity and mortality worldwide. Ukraine - one of the countries of Europe, leads the sad rating of the number of identified HIV positive and AIDS cases and deaths from the disease [1]. Chronic hepatitis C (CHC) is observed in 60-70% of HIV-infected individuals, due to the common modes of transmission of viruses. Co-infection with HIV / HCV is an important public health problem, since viruses, acting synergistically accelerate the progression of liver disease [2]. HIV accelerates the progression of chronic hepatitis C to cirrhosis and hepatocellular carcinoma, thus increases "liver" mortality. Violations of cell-mediated immunity plays a key role in the pathogenesis of HIV infection and have an influence on the strength of the immune system response to specific antigens [3; 4], because these studies focused on the study of the state of T-cell immunity in HIV-infected patients. Thus, insufficient knowledge about the impact of HCV on the performance of T-cell immunity in patients co-infected with HIV / HCV proves the feasibility of their comprehensive study in order to identify their interest in the pathogenesis of this disease.

Materials and methods. Study on the work carried out at the Department of Infectious Diseases of Kharkiv National

Medical University, located at the Regional Clinical Hospital of Infectious Diseases of Kharkiv and Kharkiv regional center for prevention and control of AIDS. Features of T-cell immunity were studied in 60 patients: 30 HIV-infected patients and 30 patients co-infected with HIV / HCV. Among the patients surveyed, the number of men were 41 (68.3%), women - 19 (31.7%). Age of patients was 20-63 years. The comparison group consisted of 32 healthy subjects who were matched for age and sex with the patients studied groups.

Patients underwent studies using peripheral blood hematology analyzer ABX PENTRA 60c Plus (HORIBA ABX Diagnostics Inc., France); immunophenotyping using flow cytometry EPICS™ XI™ (Beckman Coulter, USA). Statistical analysis was performed using the software package «Statistica for Windows», 8.0. Methods that were used include: descriptive statistics (numerical description of variables - the arithmetic mean (M), average sampling error (m), definition of the significance of differences (p)), verifying by Student t-test, Fisher's representative samples, the method of correlation of structures [5].

Results. In HIV-infected individuals compared with controls, there is a significant decrease in the relative content of T-helper cells (CD4+) 1.6 times (p<0.001), CD45+ 1.8-fold (p<0.001) and an increase in relative and absolute number of total lymphocytes (CD3+) - 1.1-fold, respectively (p<0.01)

and 1.5 fold ($p < 0.001$). Also a trend was set that does not reach the level of confidence in the form of lower absolute number of T-helper CD4+ ($p > 0.05$) and CD45+ ($p > 0.05$). Thus, in HIV-infected individuals there were declines in CD4+ and CD45+ T lymphocytes.

In patients co-infected with HIV/HCV, results showed significant difference of T-cell immunity in the form of lower relative content of CD4+ T lymphocytes in 2.1 times ($p < 0.001$) and CD45+ T lymphocytes in 1.9 times ($p < 0.001$), an absolute content CD45+ T lymphocytes in 1.2 times ($p < 0.01$) and CD4+ T-lymphocytes by 1.8-fold ($p < 0.001$), as well as increase in the absolute number of CD3+ T lymphocytes in 1.3 times ($p < 0.05$). Also showed a trend toward an increase in the relative number of CD3+ T lymphocytes in 1.1 times ($p > 0.05$).

Thus, patients in this group showed a decline in CD4+ T-lymphocytes and CD45+ T lymphocytes as a background compensation slight increase in the content of total T-lymphocytes (CD3+). Comprehensive assessment of the relation of these changes of T cell immunity is shown in Fig. 1.

Fig. 1 shows that the degree of deficiency of CD4+ and CD45+ T lymphocytes ($t = 5.85$; $p < 0.001$) is 3.25 times higher than the compensation phenomena as increase in the content of T-lymphocytes ($t = 1.80$, $p > 0.05$).

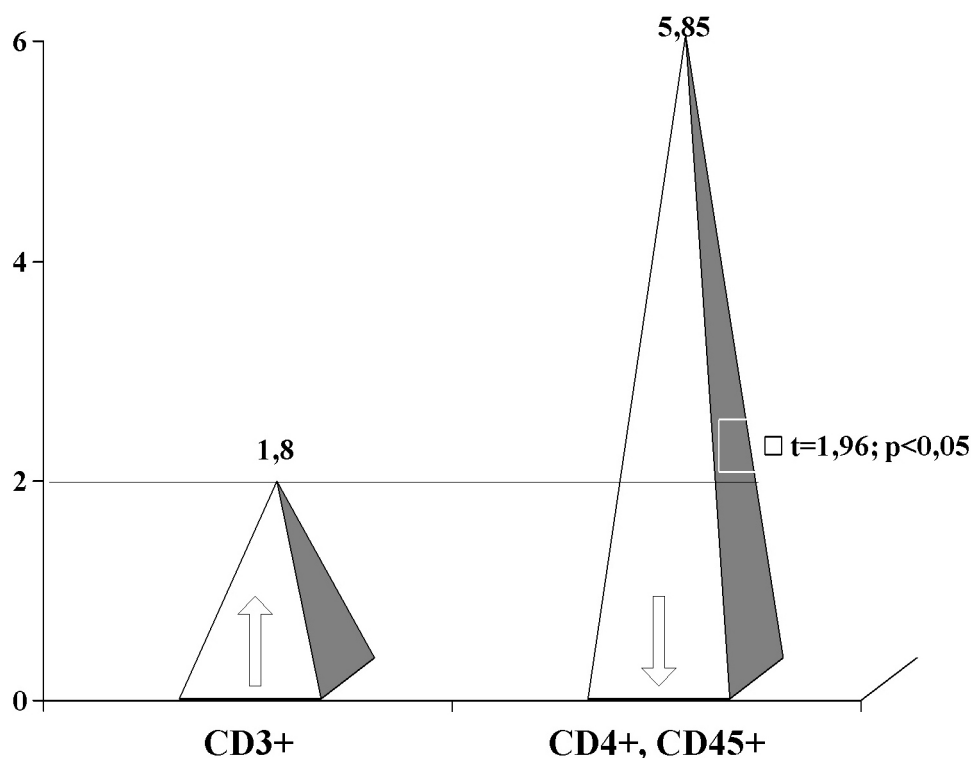


Fig. 1 Comprehensive assessment of the extent and direction of the deviation from the control of T-cell immunity in patients co-infected with HIV / HCV

↑ – increase, ↓ – decrease.

Note that a pronounced deficit of CD45+ T lymphocytes potentiate apoptosis processes and uninfected CD4+ T lymphocytes in HIV die preferably by apoptosis mechanism. It thus follows that in patients co-infected with HIV/HCV there is active involvement of both mechanisms of death of CD4+ T lymphocytes. Infected CD4+ T cells die largely by the mechanism of necrosis due to the cytotoxic effect of the viral proteins and uninfected CD4+ T cells die largely by the mechanism of apoptosis [3].

A comparison of the values of T-cell immunity in groups of patients showed that significant differences were observed between the content of CD4+ T lymphocytes. Thus in patients co-infected with HIV/HCV, compared with HIV-infected individuals, showed a reduction in the relative content of CD4+ T-cells 1.3-fold ($p < 0.05$) and in absolute numbers 1.5-fold ($P < 0.05$). Concerning other parameters, the trend did not reach the level of confidence, as there was a reduc-

tion in the absolute number of T-lymphocytes in 1.2 times ($p > 0.05$), (relative to 1.1 times and the absolute 1.2 times ($p > 0.05$) contents of CD45+ T lymphocytes.)

When comparing the ratio of the integrated assessment of compensatory and decompensatory events of T cell immunity in patients in established groups (Fig. 2), in HIV-infected persons a slight imbalance of these processes with a predominance of a deficiency of compensation (ratio 0.85) was noticed. Patients co-infected with HIV / HCV only showed the trend ($t = 1.80$, $p > 0.05$) with a compensatory increase in T lymphocytes, whereas the decrease of CD4+ and CD45+ T lymphocytes reaches significant values ($t = 5.85$, $p < 0.001$). Consequently, they have a profound deficiency compensation of T-cell immunity and, therefore, have a lower ratio value (0.31). So, co-infection of HCV with HIV largely worsens the condition of T-cell immunity, worsening the deficit compensation.

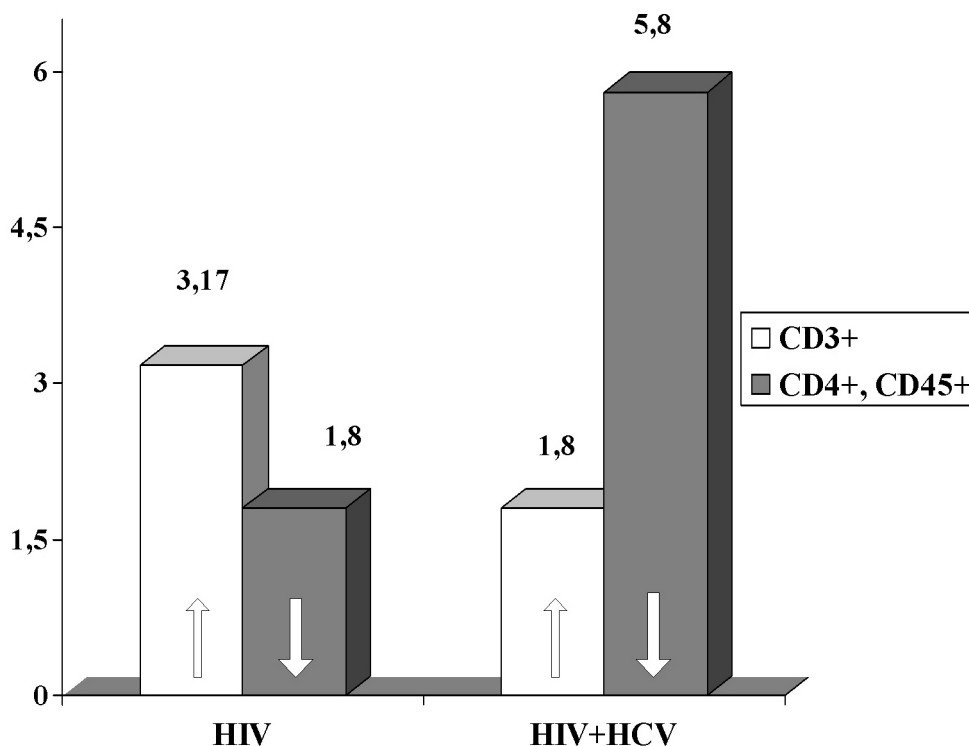


Fig. 2 Integrated assessment of the extent and direction of the deviation from the control of T-cell immunity in groups of patients

When considering the degree of deviation of rank structures from control values of T-cell immunity, it is established (Fig. 3) that in both groups the first position is occupied by a two rank deviation relative content of CD4+ and CD45+ T lymphocytes. By other indicators, rank differences were found in the groups. It can be concluded that the degree of increase in the absolute and relative content of CD3+ T lymphocytes in HIV-infected patients hold high ranks of third and fourth, and in patients co-infected with HIV/HCV, respectively, the penultimate (fifth) and the last (sixth) rank.

On the contrary, the degree of reduction in the absolute number of CD4+ and CD45+ T-lymphocytes in HIV-infected persons held low ranking positions (fifth and sixth respectively), and in patients co-infected with HIV/HCV high third and fourth grade. The results suggest that in patients co-infected with HIV/HCV there is a weakened compensatory role of increasing production of T-lymphocytes (CD3+) and enhanced pathogenetic significance of reducing absolute CD4+ content and CD45+ T lymphocytes.

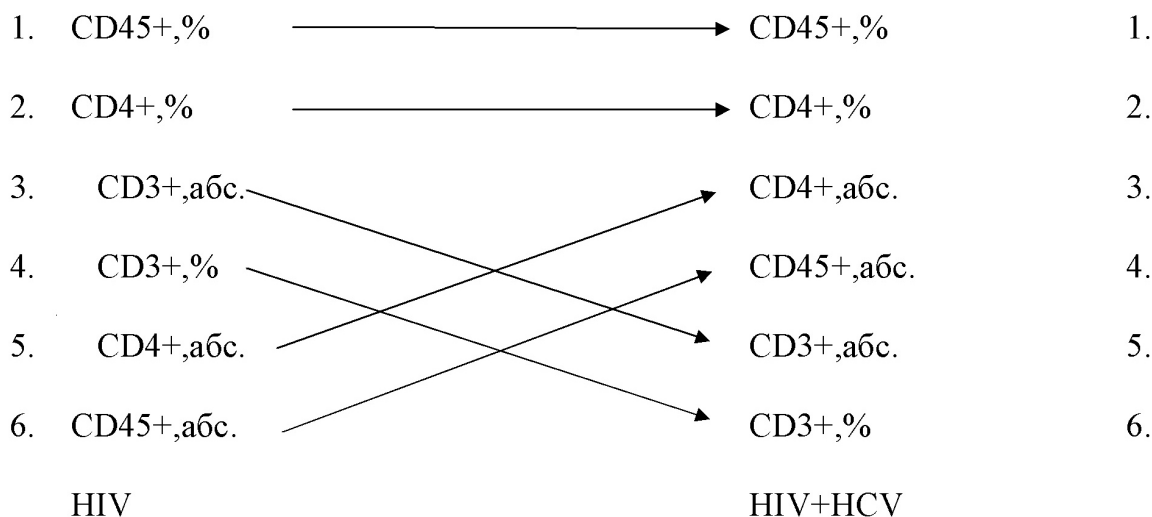


Fig. 3 The ranked structure of the degree of deviation from the control values of T-cell immunity in groups of patients

The mathematical expression, considered above shows the distinctions of rank structures that can serve as rank correlation coefficient (ρ_s). Its values were equal to $\rho_s=0,54$ ($p>0.05$). From this it follows that the significant correlation between the

ranked structures shown in Fig. 3, and there is no indication of substantial (46 %) differences. Thus, adherence to HCV HIV infection causes a significant increase in the depression of T-cell immunity, causing expressed its deficit compensation.

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Studying the role of complex echographic researches in diagnosis of chronic viral hepatitis in children

Abstract: Application of complex echography gives the chance to track change of size and structure of liver in children with CVH during its course, to define existence of fibrosis, to specify localization and depth of an arrangement of fibrous sites, to receive the image volume in real time and to distinguish possible complications and symptoms of portal hypertension at early stages.

Keywords: echography, elastography, liver, chronic hepatitis.

Actuality. The high level of morbidity with chronic viral hepatitis (CVH) presents the serious problem for public health in many countries of the world, because of their everywhere prevalence as symptomless severe and progressing from till to cirrhosis of liver (from 30 to 70%) and hepatocellular carcinoma (from 5 to 30% [3; 4]).

The CVH's particular actuality is presented in pediatrics, where one of its causes is considered the inopportune, and, in some cases, as mistaken diagnosis of pathologic process in the liver.

It is caused with various clinical course of disease, similarity of symptoms with other diseases of digestive organs "scarcity" of objective features, insufficient coverage in literature on the question of pediatrics for screening methods of diagnosis, quite often absence of parallel between pathologic changes in the liver and disease's manifestation [4; 5; 7] Experience acquired in pediatric practice witnesses on necessity of wide popularity and general introduction of ultrasound diagnosis (USD).

The preference is given to ultrasound echography in combination with dopplerography (DG) of vessels of different system, that is not only successfully complements the two — dimensioned USI but gives possibility to reveal the delicate mechanisms of hemodynamic disorders in the cases not being diagnosed at use standard echography [1; 2; 6; 8]. From this point of view the determination of DG' role in complex evaluation of liver state at CVH in children is the most significant.

The questions of optimum combined noninvasive, ionizing, complex, echo graphic diagnosis of chronic diffuse diseases of liver in children, study the part of complex echography remain actual problem in chronic viral hepatitis in children.

Materials and methods. We examined 184 children with chronic viral hepatitis (CVH), among 150 (81%) children were with CHD. Boys were 102, girls were 82. 40 children were researched normal complex echo graphic anatomy of liver and spleen (control groups). All patients were in RSRPMC of pediatrics in Hepatology department and in clinic of TashPMI in planning surgical department.

For making diagnosis of chronic viral hepatitis in children together with general clinical laboratory ways the complex echo graphic studies were carried out, they include multi-slice seroscale echohepatography, dopplerography (impulse-wave, colour Doppler mapping), 3D/4D echography of liver and spleen in children with chronic hepatitis on ultrasound diagnosis apparatus SSD-630" Aloka (Japan, Sterling Philips (Holland) "ISTYL-Toshiba (Japan), "Sonoscape 5000" (China) in clinic of TashPMI with use multifrequency convex and liner sensors.

Results. 184 children with chronic viral hepatitis (CVH) were in research group, among those were children with CVH and minimum level of activity 61 patients (32%), moderate were 64 (35%) and expressed were 62 (33%) level of process activity, their diagnosis was based on data of clinical, laboratory and complex ultrasound studies.

By the results of serocale echography of children with minimum activity of CVG it was revealed, that many echographic signs of liver and spleen were in norm limits, only on the side of gallbladder the thickness of bladder's walls (70,0%), echo-heterogenous content (34,0%), kinkings in bottom, body and or neck (62,0%)

The clear vascular picture was kept, but at individual evaluation the changes of vascular architectonics were marked

as enlargement or thinning the vessels in 15% children. The diameter of portal vein from 5 mm to 8 mm was revealed in all children, the dilation of v. lienalis diameter and disorder of vascular wall's clearness in patient of this activity group was not revealed i.e. by the date of USI the signs of portal hypertension were absent in children with CVH of minimum activity. We observed true changes from the side of gallbladder. The level of expressiveness for these deviations was not in accordance with level of CVH's activity.

The findings show, that at revealed clinical laboratory deviation by the results of echography in children, suffering from CVH of minimum activity, we observed true deviations only by the parameters of gallbladder: thickening of walls, echoheterogenous contents, kinkings in bottom area, body and neck, that witnessed on less sensitiveness of USI in comparison with clinical laboratory data.

At multislice ultrasound echohepatography the sizes of liver were not changed in the limits of age norm and, moderate increase of parenchyma's echogenity with heterogeneous echostructure were marked. At US- slices the microgranular hyperechogenic inclusions were determined, beginning from the depth 12,9–13,1 mm.

At volume three- dimensions (3D) reconstruction US-images of liver in children with CH of minimum activity even and smooth liver surface was marked.

At elastography of child with CVH the minimum level of activity at the moment of maximum compression the liver had three-colour staining (red, green, blue) by that the middle index of tissue's elasticity for liver was 6,4 kPa, that was according to minimum level of fibrosis by Melavir scale (F 0–1).

Echography data on liver and spleen at CVH of moderate level activity were remarkably differed from indices of patients with minimum activity. At CVH of moderate level the liver parenchyma had small focal structure in 44% patients, and, 40% children had middle focal structure.

16% patients were revealed the presence of large focal structure, that is typical for connective tissue elements, i.e. it is obviously according to morphological picture, when infiltration of portal tracts with different cellular elements, and, simultaneously increase of collagen fibers, thickening, neoforations and collagenization of reticuline fibers, occur. Echogenity of liver was slightly increased in 22% children, moderate parenchyma's echogenity was registered in 46% patients, and, in 44% the high echogenity of liver parenchyma was determined. The disorders from the side of vascular picture were true differed from changes at CVH of moderate activity. The clearness of liver vessels was kept in 70% patients, 30% patients had images with different; changes of vascular architectonics: clearness less vessels' thinking, enhance of vascular picture and thickening vascular walls. The diameter of portal vein more than 9 mm was referred to indirect signs of portal hypertension. In echography of liver vessels the signs of portal hypertension were accompanied with disorder of walls state as induration, thickening, tortuosity, with the deformity parts of vascular cavity.

The changes of gallbladder as thickening of walls were revealed in 82% patients with CVH of moderate, activity, 24% patients revealed periofocal reaction: wall thickening more than 3 mm and presence "double contour" of the wall. Echoheterogenous content was in 70%, the kinkings in bottom area, body and neck were in 70% patients. Changes of spleen's echo structure as increase of echogenity were revealed in 70%, as induration of parenchyma in 68% patients. Spleen vein in 24% the diameter increased to 7 mm. the disorder of walls V. lienalis has the image as induration and tortuosity of vessel in parenchyma of organ.

In multislice ultrasound echohepatography at CVH of moderate activity the sizes of liver were not changed in 25% cases, and, in 75% cases hepatomegaly was revealed, it was marked the moderate echogenity of parenchyma with heterogeneous echo structure. At US- slices the microgranular — and middle granular including were determined, beginning from the depth 12,1–12,9 mm.

At volume three- dimensions (3D/4D) reconstruction US- images of liver in children with CVH of moderate activity didn't mark expressed tuberosity of liver surface.

In elastography in children with CVH moderate activity at the moment of maximum compression the liver had three-coloring (red, green, and blue), middle index of liver tissue elastic was

7,7 kPa, that was according to moderate level of fibrosis by Melavir scale (F2).

In expressed activity of CVH thickening of walls and congestion in gallbladder were typical.

In CVH expressed activity the hepatic vessels were kept clear in 12% patients and they were not visualized distinctly in 64% patients, which were revealed as disorders of integrity for vessels picture, thickening of their walls, tortuosity of contours. In 24 children vessels were not visualized. The portal vein with diameter more than 9mm was revealed in 34%, more than 12mm in 40%, in 26 children the diameter of vessels was not more than 5–8 mm.

From the side of spleen it was revealed that the form of organ in CVH of marked activity in 44% was semilunar, in 56% patients due to large size it has biconvex form with round borders, apparently, it was connected with increase of thickness and width of spleen.

In 100% cases there were marked increase of echogenity and induration of spleen parenchyma on the account of presence of connective tissue structures.

In multislice ultrasound echopatography in CVH of expressed activity the liver sizes were not changed in 11% cases, and, in 89% cases hepatomegaly was revealed, it was marked the increase echogenity of parenchyma with heterogenous ecostructure. At US — slices micro granular-and middle granular hyperechogenic including on the depth of 1,9–4,9mm were determined.

In three dimensioned volume (3D) reconstruction US-images of lever in children with CVH expressed activity the tuberosity and unevenness of hepatic contours were revealed.

In elastography at the moment of maximum compression the liver had three-coloring (red, green, blue), middle index of tissue elasticity was 9,5 kPa, that was according to expressed fibrosis by Metavir (F3).

Thus, we determined that dynamics of changes for echographic signs liver, gallbladder and spleen was determined with the level of activity of pathological process in liver, and, it was not always in accordance with clinical laboratory data.

For more early and exact diagnosis of forming portal hypertension and its consequences the children with CVH were included in the diagnostic complex of ultrasound dopplerography for liver and spleen.

The analysis of hemodynamic disorders in vessels of liver and spleen in children showed that sensitivity of given method in evaluation of severity of pathological process in liver was higher than in other clinical laboratory methods, including seroscale USI-data. Here, practically all studying parameters were differed from the indices of healthy children ($p < 0,001$).

Conclusion. The using of complex echography methods gives opportunity to control changes of size and structure of liver in children with CVH during its course, to determine the presence of fibrosis, to specify localization and depth of fibrosis parts, to get volume image in real time, and to recognize possible complications and signs of portal hypertension in early stages.

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Section 4. Pedagogy

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Role of frebel course in formation of professional training for pre-school teachers in western Ukraine (last third of the XIX – early XX centuries)

Abstract: The article shows peculiarities of formation of professional training for pre-school teachers in Western Ukrainian lands – Galicia, Bukovyna and Trans-Carpathia, which in the last third of the XIX – early XX centuries were parts of Austrian-Hungarian Empire. Experience of professional training at Frebel course, which were active at teachers seminaries, and possibilities of its use in modern conditions of higher pedagogical education of Ukraine have been analyzed.

Keywords: teachers seminary, Frebel course, pre-school teacher.

Sources of children's education lie foremost in protecting children from possible harmful impact of natural and social environment. Clear and even strict organization of supervision over boys and girls was considered a sufficient condition for successful functioning of first children's institutions which originated in Austrian Empire in between the 20s and the 30s of the XIX century. The idea of children's institutions serving not only protective function, but also educational one led to the idea of special training of own personnel [7, 188].

According to scientists and researchers (Sh. Peresh, S. Rusova, I. Adamek, Z. Nahachevska at al.), first specialized institutions for professional training of pre-school teachers were founded almost at the same time as in England, Germany and Austria. In England first such institution for women was founded in 1836 by Charles Mayo who had been studying pre-school education from Swiss pedagogue J. Pestalozzi [3, 135].

Similar education institution in the same 1836 was opened in Germany by evangelical priest Teodor Fridner. Teachers training was also conducted in accordance with the ideas of Johan Pestalozzi, prayers and religious chants were also introduced, though. During studies which were conducted by the director himself special attention was paid to physical and psychical development of future teachers.

In 1837 the first institution for pre-school teachers training was opened in Austrian monarchy, in the town of Toln (south-western part of modern Hungary) thanks to efforts of the founder of Society of Spreading Pre-School Institutions in Hungary L. Feshtetich [3, 137]. In 1834 the institution was relocated to Pest (currently Budapest).

Studies at the pedagogical institution lasted for 1 year. For the first decades males only were admitted, and starting from 1858 women were allowed to study there as well [8].

For over three decades, the institution for pre-school teachers training in Budapest was the only pedagogical institution of such kind in Austrian Empire and welcomed students from different regions of the state. This stipulated founding a dormitory. Some of new-comers, who did not get dormitory accommodation, received a monthly social benefit [3, 139].

Need for a pre-school female occupation that required certain education was grounded by outstanding German pedagogue Friedrich Frebel – founder of the original system of pre-school education. Starting from 1839 he held in Blankenburg courses for girls and women and taught them to be teachers. His "kindergarten" (1840) was planned as an example institution for training organizers (leaders) of children's games. In the future this educational institution was supposed to develop gifts and simultaneously offer them to public through professional children's magazine for a wider circle of specialists [7, 110].

The 60s and the 70s of the XIX century became in the newly-formed Austrian-Hungarian Empire the period of social recognition of both Frebel educational system and a new pedagogical occupation – children's teacher. The law on people's schools (1869) presupposed creation of new educational institutions of teachers seminaries. Women's seminaries also had to become key points for pre-school teachers training.

The model of official system of pre-school education and specialists training in the Austrian part of Austrian-Hungarian Empire was defined by the Order of Ministry of Religions and Education of June 22, 1872, which approved regulations for kindergartens and adjoining institutions and stated principal forms of pre-school professional training [2, 15-16].

Obtaining teacher's occupation was possible: 1) through full-time studies at a state teachers seminary, which let receive the right to employment as a teacher, alongside with receiv-

ing a teacher's certificate; 2) at a one-year (Frebel) course at state women's teachers seminaries; 3) through independent or private training with following 3-month practicum at pre-school institutions with distinction (part-time kind of Frebel course); 4) at a private course which was active at private pre-school education and had the right to "go public", i.e. issue state-recognized certificates.

State women's teachers seminaries in Galicia were opened in 1871 – in Lviv, Peemysl and Krakow [6, 22-23]. In Bukovyna a state women's seminary was founded in Chernivtsi in 1872. [2; 12]. At all seminaries were organized kindergartens with distinction that were supposed to become a practical experience for both full-time students and participants of one-year Frebel course which was organized upon approval of Ministry of Religions and Education of Austria and provided pre-school educational institutions teachers.

The normative act of 1872 did not contain regulations for general purpose of education, curriculum, educational contents peculiarities. Those issues were defined in the organizational statute of men's and women's teachers seminaries of May 26, 1874.

General purpose of studying at a "separate course for kindergarten teachers" was stated in Clause 93 of the organizational statute. It said that the course is aimed at encouraging participants in obtaining knowledge that are necessary for successful functioning of a kindergarten, mostly in issues of children's nature, getting to know the purpose, means and kinds of education at kindergartens, getting shrewd and reliable in performing pre-school teacher's duties [5, 22].

In 1875 first participants were enrolled in a one-year Frebel course at Lviv women's teachers seminary. With the purpose of obtaining a new teacher's occupation 17 girls applied for the course, 14 of whom received "certificate of conformity to Frebel institution manager". By its decree of March 1, 1884 the Land School Council of Galicia changed the name of the certificate for Frebel course graduates. It started saying "certificate of conformity to Frebel institution mistress" [6, 77].

The head of the Frebel course at Lviv women's teachers seminary became Frederika Zelyonchanka (married name – Hrottova), a kindergarten director. She taught some subjects and held practical classes at Frebel course, lectured on Frebel methodology to second-year students of the women's seminary. In connection with the heavy workload of F.Zelyonchanka at the course, at the seminary and the kindergarten, another position was appointed – that of Frebel kindergarten mistress assistant.

In 1875-1896 the Frebel course at Lviv women's teachers seminary had 456 participants, 413 of whom obtained their qualification certificates [6, 147-148].

A Frebel course at Peremyshl women's teachers seminary was opened in 1877/78. Due to low interest in pre-school teacher's occupation (only 6 girls applied) it was canceled the following year. It was opened for the second time in 1891/92 with 12 participants. Renewing studies was forced by the requirements of the organizational statute of seminaries,

as well as widening network of pre-school educational institutions and lack of teachers for people's schools. Frebel course graduates showed themselves well as school teachers assistants. In 1891-1897 the Frebel course at Peremyshl women's teachers seminary had 91 participants [6, 279].

Starting from 1889 in place of Vitoslava Radvanska the actual head of a Frebel kindergarten at Peremyshl teachers seminary became Teklya Hanulanka who later headed up the Frebel course where she taught Frebel methodology, modeling, singing and gymnastics [6, 245].

A Frebel course at Krakow teachers seminary could not boast on quite a number of participants first. It opened in 1876 with 6 participants as well. In 1878/79 it had only 2 participants and in 1882/83 – 3 participants. Nevertheless, the management of the teachers seminary did not close the course completely and continued enrolment process every year.

Popularity of the Frebel course at Krakow teachers seminary got wider in the early 90s of the XIX century. In 1892/93 it had 36 participants. In general, as of 1896, 279 participants received qualifications of a pre-school teacher at the Frebel course at Krakow teachers seminary [6, 306].

While admitting at a one-year course at state women's seminaries, age (16-30), physical condition, moral values, knowledge obligatory for public people's schools graduates were taken into account. Also musical hearing and vocal voice, as well as gymnastics skills, were considered [2, 16].

Participants of first Frebel courses at teachers seminaries had the following subjects: education science and kindergarten theory, teaching language (language and subject knowledge), free-hand painting, work with shapes, singing and gymnastics. Special attention was paid to practical training which took 7 hours per week out of total 24. Later religion studies was added to the existing list

For almost 20 years teaching at Frebel courses at Lviv and Peremyshl women's teachers seminaries was conducted in Polish, but within Utraquist regime in the mentioned seminaries with resulting bilinguism, it was introduced in Frebel courses as well. Land School Council of Galicia by its decree of September 21, 1894 gave the participants of the local Frebel courses the possibility to take the course and examinations in both land languages – Polish and Ukrainian [6, 255]. The Frebel course at Krakow women's teachers seminary remained a Polish-taught one.

In the mid-80s women's teachers seminaries in Galicia introduced part-time kind of studies at Frebel courses. Part-time participants studied independently or at private pedagogical courses. The program included a mandatory 3-month practicum at kindergartens with distinction, and certificates were issued upon passing examinations on the subjects which were taught at a full-time Frebel course [2; 17; 6, 148].

In 1886/87 qualification certificates of "Frebel institution mistress" were issued to 9 participants at Lviv women's teachers seminary. As of 1896, 86 participants used this kind of pre-school specialist training and successfully passed qualification examinations at Lviv teachers seminary [6, 148].

Chernivtsi women's teachers seminary did not have a full-time Frebel course, yet in the late 90s of the XIX century a part-time kind of training for pre-school teachers was introduced through a 3-month practicum at a kindergarten with distinction. Among those who were first to receive qualification certificates of "pre-school teacher" were E. Rotenburg and L. Tumlich in 1897 [1, 1-2].

Thus, the qualifications of a pre-school teacher in the last third of the XIX – the early XX centuries in Galicia and Bukovyna could be obtained through studies at women's teachers seminaries alongside with qualifications of a people's school teacher or at a special Frebel course (full-time and part-time) that were active at those seminaries. The Frebel course namely contributed most of all to formation of the new independent occupation of a pre-school teacher.

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Students' participation in the scientific activities of the University

Abstract: This article presents the results of studies involving students in research activities of GSEM UrFU, USUE and GU. Differences in scientific prospects of future computer scientists, managers and economists have been studied.

Keywords: student; scientific activity.

During the period from September 22 to October 19, 2014 the monitoring of student scientific and research activity was conducted among students of the first year of the Graduate School of Economics and Managements of the Ural Federal University (GSEM UFU), Ural State University of Economics (USUE) and Humanities University (HU). All of them perform their professional activity in Yekaterinburg. Two aspects of scientific activity are reflected in the present research. The first aspect is the participation in the current

scientific events and conferences. It shows the interest of students in the scientific activity. The second aspect is educational plans of a student. This item reflects a desire of a student to do a scientific activity in the future because the master's degree is also related to the research activity. During this period a survey was performed among the university students of the following disciplines: economics, management and applied computer science. 109 full-time students were surveyed within the frames of the research.

Table 1. – Overview of the survey participants according to universities

Discipline	UFU	USUE	HU	Total
Economics	21 (223/28)*	30 (335/60)	5 (40/25)	56 (598/135)
Management	24 (185/50)	13 (144/60)	2 (26/6)**	39 (355/116)
Applied computer science	7 (33/26)	4 (25/10)	3 (30/6)	14 (88/42)
Total	52 (441/104)	47 (504/130)	10 (96/37)	109 (1041/271)

* Number of admitted students/number of state-funded seats

** State-funded seats at HU for the disciplines of Management and Applied computer science are paid from the HU funds

The total number of students and the number of state-funded seats were defined according to the orders of the first year student admissions of the respective universities [1; 2; 3].

More students of economics participated in the survey than the students of management and applied computer science. It is determined by the domination of economic disciplines.

Table 2. – Cost of studies according to universities (thousand rubles)

Discipline	UFU	USUE	HU
Economics	105–198*	95–76**	81
Management	105–125	95–76	81
Applied computer science	130	97–78	76,8

* The cost depends on a concrete discipline, department

** The cost depends on the number of points scored by a prospective student

According to the obtained results, the cost of studies at GSEM UFU is maximal for all considered disciplines. Herewith, the number of students of economic disciplines at USUE is bigger as well as the number of state-funded seats.

A negative answer was given to the question «Do you participate in scientific and research projects, i. e. projects that go

beyond the educational process?» by most students, which is a standard situation for higher educational institutions. However, it should be noted that a significant number of students attends different scientific events.

Let's specify variants as follows: 1 — yes, I participate; 2 — no, but I attend other scientific seminars and events; 3 — no, I don't participate.

Table 3. – A share of students participating in scientific and research projects

Discipline	University	1	2	3
Economics	UFU	23,81%	47,62%	28,57%
	USUE	23,33%	33,33%	43,34%
	HU	0,00%	40,00%	60,00%
Management	UFU	12,50%	45,83%	41,67%
	USUE	7,69%	30,77%	61,54%
	HU	0,00%	50,00%	50,00%
Applied computer science	UFU	14,29%	28,57%	57,14%
	USUE	0,00%	50,00%	50,00%
	HU	0,00%	33,33%	66,67%

Herewith, about 16% of first year students have scientific publications, which is insignificantly more than the number of those engaged in scientific activity. This data was obtained

upon the answer to the question «Do you have any scientific publications?».

Table 4. – A share of students with scientific publications

Discipline	University	Have	Have not
Economics	UFU	19,05%	80,95%
	USUE	26,67%	73,33%
	HU	20,00%	80,00%
Management	UFU	12,50%	87,50%
	USUE	7,69%	92,31%
	HU	0,00%	100,00%
Applied computer science	UFU	14,29%	85,71%
	USUE	0,00%	100,00%
	HU	0,00%	100,00%

The question «Have you participated in the events from the list?» was posed. Concurrently, the maximal level of events out of the variants that students responded to was taken into consideration. If we perform a comparison according to the level of conferences, which students took part in, the result will show that the most visited events fall within their university. Moreover, over one third of the respondents

haven't visited any scientific events at all.

Let's specify the variants as follows: 1 — conferences conducted at their university; 2 — conferences conducted at the higher educational institutions in Russia; 3 — conferences conducted abroad; 4 — schools, seminars, expeditions; 5 — I haven't participated.

Table 5. – Shares of students as per event

Discipline	University	1	2	3	4	5
Economics	UFU	23,81%	33,33%	0,00%	14,29%	28,57%
	USUE	56,67%	6,67%	3,33%	10,00%	23,33%
	HU	20,00%	40,00%	0,00%	20,00%	20,00%
Management	UFU	12,50%	12,50%	0,00%	20,83%	54,17%
	USUE	15,39%	7,69%	7,69%	23,08%	46,15%
	HU	0,00%	50,00%	0,00%	50,00%	0,00%
Applied computer science	UFU	14,29%	0,00%	0,00%	28,57%	57,14%
	USUE	0,00%	25,00%	0,00%	0,00%	75,00%
	HU	0,00%	0,00%	0,00%	33,33%	66,67%

The final question was: «What is the highest degree you would like to obtain?». This question is important to define students who plan to engage in science in the future. A considerable part of management and applied computer science

students do not plan to continue education under this specialization.

Let's specify variants as follows: 1 — baccalaureate; 2 — master's; 3 — PhD; 4 — I haven't decided yet.

Table 6. – Shares of students according to planned level of education

Discipline	University	1	2	3	4
Economics	UFU	33,33%	47,62%	9,53%	9,52%
	USUE	26,67%	43,33%	13,33%	16,67%
	HU	60,00%	20,00%	20,00%	0,00%
Management	UFU	37,50%	37,50%	4,17%	20,83%
	USUE	53,85%	15,39%	7,69%	23,07%
	HU	50,00%	0,00%	0,00%	50,00%
Applied computer science	UFU	42,86%	14,28%	0,00%	42,86%
	USUE	50,00%	25,00%	0,00%	25,00%
	HU	100,00%	0,00%	0,00%	0,00%

On the assumption of the obtained research results, a few conclusions can be made. They reflect the agenda, plans of students for the future and engagement of students in scientific activity.

1. The share of students participating in scientific and research projects at all universities and disciplines is low (15,60%); herewith, a group of 39,45% is interested in widening their horizons and obtaining additional knowledge, which is a good indicator. Moreover, students of economic disciplines participate more in scientific events. The best indicators among the considered universities fall within GSEM UFU (61,54%).

2. 16,51% of students have scientific publications, which can be considered a negative indicator relative to the total number of those engaged in research at the moment (15,60%) and shows the reduction of interest in scientific activity in the first year in the whole. The best indicators are shown at USUE (19,15%).

3. 44,04% of respondents took part in conferences of different level. Furthermore, the students of HU participate the most in all-Russia conferences (30,00%), and USUE students participate the most in internal and international events (40,43% and 4,26% respectively).

4. 42,20% of students plan to continue scientific activity enrolling for the master's or PhD. Moreover, the best indicators fall within USUE (44,68%) and GSEM UFU (44,23%).

On the assumption of the results of the research, one can conclude that students, who choose cheaper studies (up to 90 thousand rubles), are not interested in scientific activity, which is reflected by HU indicators. Students studying the disciplines the cost of which is 90–115 thousand rubles show maximal interest in scientific research with further decrease of the interest due to the increase of the cost of studies. The increase of activity in the category of 90–115 thousand rubles is stimulated by the best correlation of price and quality of education along with free time for additional research.

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The European experience of integrated curriculum in the context of school multilingual education usage

Abstract: The article deals with the educational approach using more than one language as a medium of instruction and providing learning some languages as systems. Such educational approach needs special methodology and curriculum design as well as technologies supporting students' plurilingualism forming.

Keywords: school multilingual education in Europe; integrated curriculum; plurilingualism forming.

Under the influence of the migration processes, global mobility and multiorientation of communication the concept 'language education' has been changed. In the context of the earlier existing in Europe nation-states this concept was understood as mastering pupils' mother tongue automatically matching the language of instruction at schools. But from the end of the twentieth century active acquisition of modern foreign languages was begun in schools of European countries. Global English and other main European languages as well as other languages of international communication were widely used in school programs of European countries. However, the more attention was provided to diverse linguistic heritage, preservation and learning languages previously used less widely (minority languages, regional, classical and migrants' languages) [6]. Therefore, the language education in Europe has become multilingual. The concepts 'multilingualism' and 'plurilingualism' have become the core ones in the European language policies. According to views of J. Cenoz multilingual education can be defined as 'teaching more than two languages provided that school aims at multilingualism and multiliteracy' [3, 8–9].

Now this educational direction has the aim of forming students' individual plurilingualism as the complex ability to use the integrated multiple linguistic competence. According to the holistic conception (F. Grosjean F., 1989; Ludi G.& Py B, 2009; Daryai-Hansen P., Gerber B., Lörincz L., 2014) the concept of 'individual's plurilingual competence' has the following characteristics: multiplicity, dynamism, integrity, dependence on the context and individual peculiarities [5]. The dynamic model of plurilingualism (Herdina P. & Jessner U., 2002) suggests considering multilingual speakers as 'persons with a distinct communicative competence allowing interrelating in various ways in the languages acquired by learners' [8].

To intensify the process of language teaching at the secondary level the important initiative of European experts appeared to create a joint educational context for all languages included into the teaching and learning process or *language curriculum integration* [4]. This process within one school is to bring together all the items in one language education sector. The integrated curriculum should be the basis for training programs with all learnt languages that allow adopting the common structure and the curriculum content. To achieve this:

1) the approval of the common terminology, principles and standards for the field of language subjects, particularly in the evaluation procedures is necessary;

2) creating recommendations on common methodological approaches used to establish connections between learnt languages to form cross-cutting skills and creating conditions for cross-language transfer is compulsory [4].

The principles of integrated curriculum in multilingual education formed in Western Europe at present can be characterized by following features:

1) initial training in native language has mandatory status for each student and includes forming literacy in writing, because the processes of thinking is established in individual's native language, it is the basis for capturing the subject content taught in non-native languages in the future study;

2) learning L2 and L3 is accompanied by constant comparison with native language in relevant aspects. In the past context of teaching foreign languages and bilingual education there was a clear linguistic distinction and separation of languages to avoid interference; in new conditions of comparative-contrastive approach the transfer of language skills is most extensively used;

3) learning additional language as a system (L2, L3, Ln) does not provide sufficient training students for using that language as a medium of instruction or means of mastering the contents of non-linguistic subjects. To facilitate understanding the subject content in the context of non-native language learning such technologies as *scaffolding* and *translanguaging* are widely used. The *scaffolding* technology involves ongoing support provided to a learner by an expert (teacher or peer-student), which often means activating prior knowledge or introducing students to the processes associated with mastering subject content in the native language and giving learners structures or terms to use, acquainting with linguistic structures of the new language (s) to express the subject content meaning. To use L1 is not prohibited, but rather encouraged, because the level of mastery in subject matter (output) under the following conditions is higher [1; 2]. *Translanguaging* is the process by which a human brain is capable of accessing two or more linguistic data based in order to formulate a tapestry of words in various languages. It refers to educational prac-

tice using plurilingualism as a resource rather than ignoring it or perceiving it as a problem [9]. Transfer occurs irrelevant of the languages being linguistically related or their using or not the same writing system and the transfer is multidimensional, meaning that all of the learners' languages contribute to their linguistic and cognitive development.

The example of integrated curriculum is provided in Basque secondary school (Ikastolas) in Basque Autonomous Region of Spain. The school works systematically in four languages: Basque (basque. *Euskara*), Spanish, English, French. The integration of curriculum provides:

- 1) the determination of the training overall goal and competence levels, which must be achieved in each of the languages;
- 2) the choice for uniform application of approaches and methodologies in all the languages;
- 3) the establishment of an integrated framework of content; which is complementary for language teaching in nature, but has specific for each of the learned languages information;
- 4) functions performed by every language in public life of the community are registered, and languages appear in the school curriculum according to their functioning in society;
- 5) the decision on the start of training each language, the amount of teaching time and intensity of the process of learning are discussed by the teaching staff in every separate case.

The teaching and learning process takes place in the context of the methodological approach aimed at developing the pupil's ability to use the curriculum in all languages and therefore it requires:

- 1) the use of common procedures and strategies for the development of oral and written skills to understand and pro-

duce four kinds of speech activity;

- 2) the review of discursive situations and genre variety of literary texts, inherent common characteristics (structure, organization, content and functions) in different languages;

- 3) the general information about language as a phenomena is actually presented in the context of mastering one language and is repeated and clarified in the course of other languages learning;

- 4) forming students metalinguistic consciousness is developed through observation, analysis, conceptualization of linguistic phenomena in all the languages;

- 5) the motivation aspect on mastering and making use of every learnt language, forming attitudes towards manifestations of language cultural features requires special attention in learning each language;

- 6) the evaluation criteria are developed and decisions are made regarding each language introduced and the place in the curriculum considering the time given to teaching them;

- 7) besides *translanguaging* and *scaffolding*, which are commonly used, new forms of language-enhancing classroom interaction providing maximizing learners' and teachers' linguistic resources, *transliteration* and *multimodal communication* are also applied [1].

The implementation process of an integrated curriculum and evaluating its effectiveness was recognized by European experts as a complex task that should not be seen as 'curriculum revolution', but rather as a process requiring gradual changes, as is aimed at creating educational communities in schools that are characterized by the presence of both horizontal and vertical links [7].

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Section 5. Psychology

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Subjectivity and peculiarities of subjective characteristics development among master's degree students

Abstract: The significance of the concept of subjectivity is dealt with in article. In activities, behavior and decision making, the subjectivity is connected first of all with individual peculiarities utilized by a person in an active life, i. e. individual peculiarities in goal setting and solution. is examined in the article. In order to determine exponents of a person's subjective qualities, we conducted a pilot study.

Keywords: subjectivity, adoption of decisions, subjective qualities, responsibility, social activity, masters, activity, personality.

Social activity, responsibility and ability to make decisions in emergency situations are characteristics of a personality determining a successful person upon conditions of dynamic changes of the environment and requirements of the modern society.

In this connection, a subject for many research works in modern psychology is an extended characteristic of a person's commitment which can be seen in his activities and behavior, i. e. these are subjective characteristics investigated by us. In parallel with the systematic description of subjectivity, a way to detect its parameters is determined in psychology. Careful analysis of this characteristic is significant when solving practical tasks, such as professional selection, assessment and development of personnel, candidate pool. Development of subjective qualities determines the sense of life, priorities and prospects in professional career building; it helps to make decisions rationally and purposefully in problematic situations.

Subjective-activity approach of S.L. Rubinstein [1; 2] laid a solid scientific theoretical and methodological foundation in investigation of subject and subjectivity categories. Considering the problem of the owner (subject) of the process, S. L. Rubinstein was against insulation of the owner from the process, and against conception of their interrelation to be considered as external only. He saw the condition of the subject's formation and development in the process. Therefore, he noted that the owner (subject) acts transforming an object in accordance with his purpose, but also he plays different roles during the process and as a result of its fulfillment, when both object and subject are changed. Not that in respect to a specific activity, the subjectivity is determined as an ability to initiate this activity consciously and independently, to overcome inner and outer inconsisten-

cies restraining successful personal realization.

According to V.D. Shadrinov [3], the subjectivity is a person's characteristic which embraces ability to resist internal and external conditions that make a barrier during a person's interests realization (goal setting and achievement, self-actualization, etc.). Within this framework, we can say that development of subjective characteristics is a necessary condition in the ontogeny for a personality.

The subjectivity foundation rests upon the key characteristics of a personality. Therefore, personal qualities determine a person as a socially active individual. The subjectivity directs a personality to a particular purpose achievement and an ability to overcome inner and outer barriers. Kuznetsova M.D. [4] writes in her article, that the subjectivity is considered from a position of a systematic approach that embraces separate features and characters of a personality allowing an individual to keep his individuality, subjectivity, in spite of unfavorable outer factors, and characterizing him as the owner of the process.

So, on which step of a person's macro-characteristic is "subjectivity" situated? In this order, the issue of substantial characteristic of a person should be developed. From a perspective of subordination approach, *individuation* is the basic level of a person's macro-characteristic. In order to perform cognitive and transformation activities, one has to get to a conscious level of psychic reflection (cognition and regulation). This transition marks a person's transition from the individual organization level to *subjective*. Consciously separating himself from the environment, a person becomes a subject who can change the environment and himself purposefully. We can note that it is referred to the avatar of the subjective level — self-consciousness and self-regulation. A subject, being in-

volved in the complex system of public relations, becomes a *personality*. By realization of his potencies and tendencies in conscious activities, in communication with other people, a person gets to the next level of *individuality*. On this level a person's individual characteristics are realized through particular actions, particular deeds, particular achievements and results. Individuality who has realized his/her connections with the world as a single whole, who has realized him/herself as this whole but not only a part of this whole, becomes a *universum*.

So, the hierarchy of a person's macro-characteristics is as follows: individuation — subject — personality — individuality — universum.

Based on this hierarchy, we see that a person's development is growing from the individual level to the universal [5].

However, we will take the liberty to disagree with the position of "subject" level in the above mentioned hierarchy. Based on research works of A. R. Ermentayeva, it's worth noting that each subject is a personality, but not each personality is a subject. In her works, A. R. Ermentayeva [6], based on the subjective psychology of S. L. Rubinstein, A. V. Brushlinsky, K. A. Abulkhanova, considers subjectivity as an axiological attitude of a personality to him/herself and to other people, as an ability to improve communication and activities. In other words, at the hierarchy of a person's macro-characteristics, a subject is higher than a personality, for this is an inherent exponent of activity and responsibility. And subjectivity is a feature being formed, existing thanks to the established nature of a person's life, purposefulness of actions, multidimensional expressions of activity, and rational ability to change him/herself and other people.

In activities, behavior and decision making, the subjectivity is connected first of all with individual peculiarities utilized by a person in an active life, i. e. individual peculiarities in goal setting and solution. In this context, the subjectivity specificity is determined by resources of activity regulation which are topical for a person at the moment or topical in the context of a prospect.

The subjectivity model developed by M. D. Kuznetsova rests upon four basic personal qualities, such as:

- Motivational directivity of a personality to achieve success;
- General level of intellectual development;
- Reflectivity;
- Volitional regulation of behavior and subjective, internal control (internality) [7].

It's worth noting that various types of activity require solution of different practical tasks; this is why subjectivity in each type of activity will acquire qualitative diversities. From the previous statement, depending on tasks and conditions of the activity, the subjectivity structure will change: subjective qualities which are the most significant for the specific activity will come to the fore [4]. In our case, subjective characteristics will be described in the base of professionally important qualities of Master's degree students. In the contest of our research work, the subjectivity qualities to be considered are: responsibility, initiative qualities, vigor, self-independence, sustain, insistence, energy, attentiveness, purposefulness.

In order to determine exponents of a person's subjective qualities, we conducted a pilot study where the main tool used was a questionnaire "Diagnostics of a person's volitional peculiarities" by M. V. Chumakov. According to the method chosen, 9 scales of personal subjective qualities of the test persons are specified: responsibility, initiative qualities, vigor, self-independence, sustain, insistence, energy, attentiveness, purposefulness. Below are the results of the questionnaire "Diagnostics of a person's volitional peculiarities" after M. V. Chumakov (Table 1).

This pilot study was carried out at the Department of Emergency Situations of Astana city, and among Master's degree students of the Eurasian National University named after L. N. Gumilev. The study involved 20 people aged 22–40 years. Among them were 13 women (65%) and 7 men (35%). All test persons have higher education (100%).

Table 1.

Scale Testee/ Test man	responsibility	initiative qualities	vigor	self-independence	sustain	insistence	energy	attentiveness	purposefulness	Σ	The arithmetic mean value
A ₁	12	15	6	5	6	11	16	8	24	103	11,4
A ₂	16	12	18	15	19	10	17	15	17	139	15,4
A ₃	22	22	10	9	16	12	24	6	20	141	15,6
A ₄	21	18	15	15	27	15	24	12	27	174	19,3
A ₅	21	25	23	19	20	18	27	19	24	196	21,7
A ₆	21	25	14	16	11	16	27	16	16	162	18
A ₇	18	9	10	12	25	9	16	9	13	121	13,4
A ₈	24	18	15	14	15	15	25	16	27	169	18,7
A ₉	22	14	25	13	24	14	23	20	24	179	19,8
A ₁₀	19	13	8	11	18	10	19	19	18	135	15
A ₁₁	12	16	13	22	17	16	18	21	19	154	17,1

A_{12}	14	12	17	21	19	19	18	23	18	161	17,8
A_{13}	12	16	22	21	20	21	18	24	22	176	19,5
A_{14}	15	12	22	18	25	24	10	18	19	163	18,1
A_{15}	9	13	15	11	21	17	16	18	18	138	15,1
A_{16}	11	10	12	15	18	16	11	15	14	122	13,5
A_{17}	22	21	16	19	21	17	16	18	19	169	18,7
A_{18}	24	16	23	18	19	20	19	17	18	174	19,3
A_{19}	21	22	21	20	25	21	23	19	25	197	21,8
A_{20}	19	21	18	24	18	19	21	20	21	181	20
Σ	355	330	323	318	384	320	388	333	403	3154	
The arithmetic mean value	17,7	16,5	16	15,9	19	16	19	16,6	20	157,7	

Square deviation is $\delta = 4,9$.

Because this is a pilot study, we can consider that the square deviation value is applicable.

So, consider the values of the Questionnaire scales according to the walls:

1. "Responsibility" scale is on the 7th wall, i. e. the raw point is 18, which is a high value.

2. "Initiative qualities" scale corresponds to the wall 6, the raw point is 15.5, which is also a high value.

3. "Vigor" scale also corresponds to the wall 7, the raw point is 16, high value of this scale.

4. "Independence" scale also refers to the 7th wall, the raw point is 15.9 — high value of this scale.

5. "Sustain" scale refers to the wall 6, and approximate raw point is 19 which is a high value.

6. The raw point of "Insistence" scale is 16, refers to the wall 8, and the value of this scale is high.

7. The raw point of "Energy" scale is 19, it refers to the wall 5, which is a transition value of the wall for this scale. However it must be taken as a high value.

8. "Attentiveness" scale with an approximate average value of 16.6 refers to the wall 7, which means high importance of the scale considered.

9. The last scale "Purposefulness" has the average value of 20 points and refers to the wall 7.

So, it should be noted that following the results of nine scales analysis, the holistic picture of development of volitional behavior regulation of this pilot group's participants is as follows (Figure 1): 1 test person, which is 5% of all participants, gained the lowest final score (103) which corresponds with the wall 3, according to the regulatory table of the final scores of the questionnaire. The wall exponent for 95% of test persons (data of 19 people) was of a high value according to final scores of all nine scales.

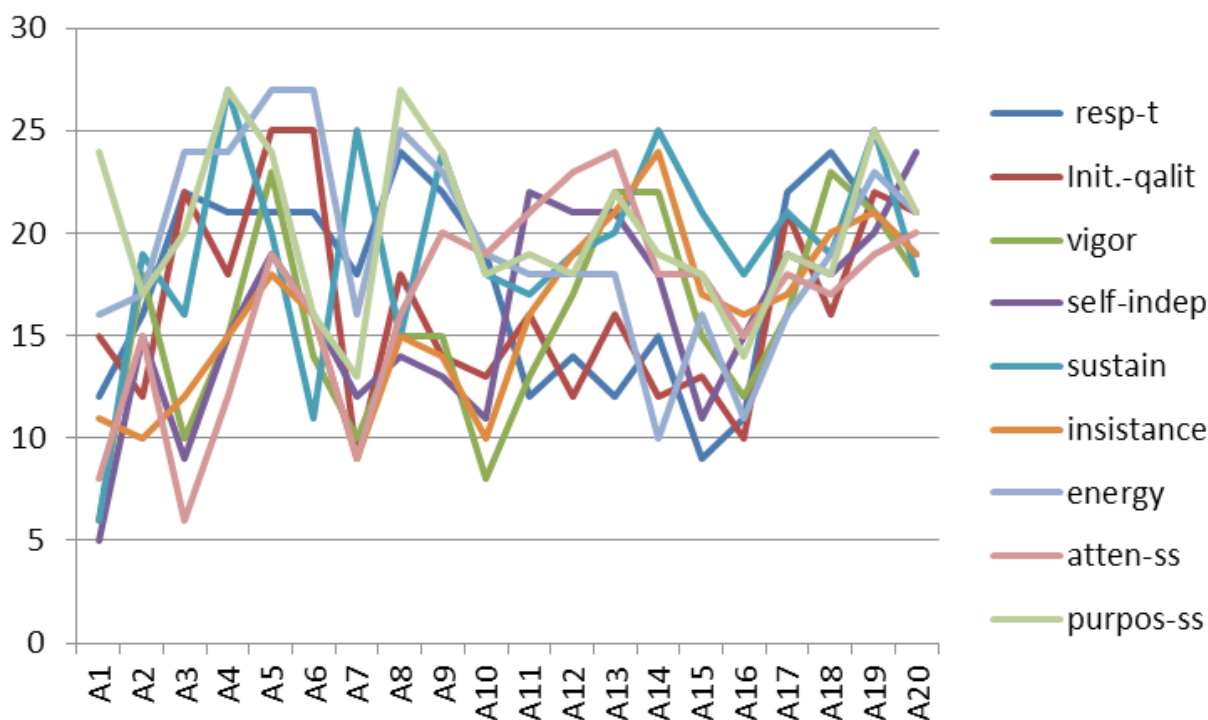


Figure 1. Comparative curve of indicators of results "person's volitional peculiarities"
Here: A_1-A_{20} – Testee/test man; **От** – responsibility; **ИИ** – initiative qualities; **РШ** – vigor; **СМ** – self-independence; **ВД** – sustain; **НС** – insistence; **ЭН** – energy; **ВН** – attentiveness; **ЦС** – purposefulness.

According to interpretation of M. V. Chumakov, the high value of purposefulness speaks for conscious life purposes of a test person. Generally, they try to plan their time and schedule of activities. Therefore, not only high life purposes are formed, but the goal of professional growth as well.

We would like to note that the final average score of all test persons (100%) who took part in the pilot study is

157.7 points, which refers to the wall 7 and which is a high value of volitional behavior regulation.

We assume that this diagnostic study of subjective qualities of purposive sample in prospect will allow forming a model of development dynamics of subjective qualities of Master's degree students.

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Section 6. Sociology

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Mediation as an important factor in the formation of civil society institutions

Abstract: Although Azerbaijan has not yet adopted a law on mediation, its roots go back to antiquity. It shows itself both in folklore and in the laws of Islam, and in today's Code of Civil Procedure of the country. Citizens, getting the opportunity to resolve disputes without resorting to help public authorities become more responsible in protecting human rights, show a willingness to engage in constructive dialogue with each other. This shows that the country has gradually formed its own model of mediation.

Keywords: Mediation, civil society, conflict, culture, legislation, traditions, Islam.

Mediation may be defined as means of conflict regulation by the third, neutral side before the court. This institute has actively developed in the West. For example, 95% of US economic disputes are resolved in this way. One reason for the popularity of this procedure — it is much cheaper to come to an end. Calculations in the UK show that the resolution of disputes through mediation costs 10 times less than their resolution in the courtroom [1].

Mediation is located at the intersection of sociology, psychology and law: any conflict covers these three areas. However, unlike a sociologist mediator does not study the relationship between society and the individual, as a psychologist is not interested in the inner motivations of the conflict, and as lawyer does not disclose the motives of legal conflict.

The mediator can be anyone. However, there are groups of people who can act as an official mediator. These are international organizations (e. g., UN, OSCE), state legal institutions, specialized state commissions, heads of institutions, public organizations (e. g., trade unions).

Unofficial mediators are those people who are well respected and treated them because of their position in society, education and experience. It can be the representatives of religious organizations, psychologists, teachers, lawyers, professional conflictologists or just people who gain prestige through their behavior and wise decision. However, these categories are relative. The mediator can be any person who knows both sides close [2, 89–91].

The mediator must first be smart, authoritative and fair man, which is, how they say, “real aqsaqal” [3]. He should be able to listen patiently to people to debate with them, putting them side by side. Here is an important condition impartiality, fairness, gaining the trust and support of both parties.

Mediation is the most flexible and democratic way of resolving disputes. The mediator tries to take such conciliatory

solutions, which will take into account as much as possible the interests of all parties involved in the conflict, where everyone is a winner. Mediation as a technology solution to the conflict that creates the conditions for a negotiated consensus through dialogue. The parties have the opportunity to not only free solution of disputes arising between them, a decision that serves the interests of everyone, they also gain experience of communication that meets the interests of both parties and directing the conflict in a constructive direction. Hence mediation is an instrument not only an effective conflict resolution, as well as a means of improving the legal culture of the population. Citizens, getting the opportunity to resolve disputes without resorting to help of public authorities become more responsible in the protection of human rights, are ready for constructive dialogue with each other.

Mediation, turning into an important factor in the formation of civil society institutions, creates the conditions for the approval of freedom, justice and security values in society. Taking its origin from the disputes between citizens, mediation gradually goes beyond this sphere, creates the conditions for approval of tolerance, openness to dialogue and consensus.

Though the real subject of the dispute may be one or more factors, in general, there are six “areas of conflict”, where each of them acts as a potential cause or driving factor. Here refer “values” (ideas about what is good or bad, just or unjust), “relations” (satisfaction or dissatisfaction of the relationship between two or more parties. Here the main factor in the relationship is associated with the past, which prevents the parties to move forward), “mood” (factors not related to the conflict, but prevent the parties make the right decision. For example, a small family quarrel or a serious problem associated with health), “information” (information that is considered acceptable for one side and unacceptable to the other side), “structure” (the presence of factors that create controversy in

the structure of the situation. For example, a lack of resources, i. e., money, time, people, etc.), and “interests” (physical, procedural and psychological interests of the parties involved in the dispute) that the mediator must take into account in their activities [4]. The real subject of the conflict can be one or more factors.

We believe that to resolve conflicts on the basis of mutual consent to the judges in carrying out their duties are necessary to pay attention to some of the mental characteristics that are specific to each country, including the peoples of the South Caucasus.

We note that the mediation, as an alternative way of resolving conflicts among the peoples of the Caucasus, including Azerbaijan, known since ancient times. We know from history the crucial role of the authority of the mediator in the reconciliation of blood enemies. Even today, in some regions, villages, lineages, and tribes of Azerbaijan dissatisfaction, conflicts are resolved elders who create peace.

In chapter (4) *sūrat l-nisāa* (The Women) verse 35 of the holy book of Muslims “Quran” husband and wife are called to reconciliation: “If there appears to be discord between a wife and her husband and if they desire reconciliation choose arbiters from the families of both sides. God will bring them together; God is All-knowing and All-aware” [5] Verse 114 of the same chapter of “Quran” says: “There is nothing good in much of their secret talks except for that which is for charity, justice, or for reconciliation among people to seek thereby the pleasure of God for which We will give a great reward” [6].

Generally speaking, in the “Koran” and Sharia laws (which form the basis of Islamic law) broadly describe the solution of disputes and conflict issues in a friendly manner, with the participation of friendly intermediaries.

In actual practice in Muslim societies as the official mediator historically advocated religious leaders, imams. Even today, people in solving conflicts, disputes are turning to their authority. In the Muslim east such classic concepts as a *divan*, an institute of *qadi* from this point of view are more important.

In history, literature and customs of the peoples of the ancient East there formed the fundamental criteria for understanding the modern mediation. Here is an example of Mulla Nasreddin [7] Folktales:

Once a rich man asked Mulla, who left the conflict with the poor. The unfortunate poor wretch smelling pilaf cooked in a cauldron of rich, the sleeves of his clothe to enjoy at least the fragrance of food. The rich man in return demanded compensation, because the smell was taken from his pilaf. Without thinking Mulla Nasreddin got small coins and shook it at the ear insatiable rich. “Now your conflict is settled — summed up the sage — it took you smell, instead you get the sound of coins!”

As can be seen, the concept of mediation is based on the lifestyle of the people and its roots can search in the culture

of any nation.

For centuries, people have seen that any serious disputes can be solved on the basis of mutually acceptable negotiation rather than through norms and hierarchical order.

Note that the mediation in the modern sense of the word is a new method for the civilized world. Its revival is due to the elimination of a rigid hierarchy that exists in society, the development of relations and globalization in the world. This situation is reflected in all spheres of society — the family, the economic and labor rights, in the experience of public administration, where the disputes and conflicts require new approaches and solutions.

Mediation in the second half of the twentieth century began to spread from the countries of Anglo-Saxon law to the countries of continental Europe. Definitely, in every national culture mediation taking its place, parallelly combines the local features. In the post-Soviet space the institution of mediation is a new phenomenon and as such, it is integrated into the country’s legal system. No coincidence that in Russia, Kazakhstan, Georgia and Moldova have already passed laws on mediation, and in Ukraine prepared a bill that has already been submitted to the legislature of the country.

Accordingly, Azerbaijan formed its own model of mediation. In 2006, for the first time in Azerbaijan was launched two-year project to provide mediation services to the population. Acting in this area the Free Consumers Union, NGO is busy with the protection of consumers’ rights, the market of goods from dangerous to human life and environmental goods and services.

The society “International Commercial Arbitration” on November 11, 2003 founded the Azerbaijan International Commercial Arbitration Court, in accordance with the law of AR “On International Commercial Arbitration” elected its arbitrators, the secretariat, organized apparatus and approved the main regulations.

By the employees of the Azerbaijan International Commercial Arbitration Court has been prepared a draft law “On Mediation” based on the practice of international and national legislation.

In co-sponsorship with the Center for Arbitration and Mediation in Azerbaijan were created Baku Mediation and Conciliation service and also Mediation Center Alliance that belong to the group “Alliance Consulting”.

The Civil Procedure Code (CPC) of Azerbaijan Republic identified opportunities to resolve disputes peacefully. Examples of this are the Articles 14 (the third paragraph), 183, 190, 261, etc. of CPC.

Thus, what are the prospects of mediation institute in Azerbaijan? Without a doubt it may be stated that mediation in the near future will take its place in the legal culture and the business community of Azerbaijan.

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Section 7. Technical sciences

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Rationing of electricity production in the rolling of ferrous metallurgy

Abstract: In given to article rationing of the electric power in rolling production of ferrous metallurgy is considered questions and the analysis of resultant sizes of a specific expense of the electric power for a variety and ball rolling.

Keywords: variety rolling, ball rolling, thyristors, consumption.

The main objectives of improving the efficiency of the energy economy of the industrial enterprises are the improvement of technological processes and energy production, improve equipment performance and to minimize the need for energy resources.

One of the energy-intensive industries is ferrous metallurgy enterprise, which have a number of energy-intensive basic and auxiliary shops. As we study the energy performance was reviewed by rolling mill.

In the rolling mills of Steel Plant redistribution of ingots is implemented for rolling in various shapes and sizes. Usually in such workshops for this purpose, several mills are established, the type of which is determined by the range of rolling.

An integral part of mills are the heating device, working stands and support mechanisms for tilting, transporting, cutting and cleaning of metal.

The main consumers of electricity in the rolling shop are motors drive rollers of work stands (main drive) and auxiliary machinery. In addition, there are various units of motors, overhead cranes, pumping and ventilation systems, as well as thyristors converters, electric lighting, etc.

Power of main drive motors of rolling mills expressed thousand kilowatts. For example mill «630» and «300» on the shop floor TWS-2 Bekabad Steel Plant consists of 28 and 32 stands, depending on the process of rolling metal.

Main drive motor for the mill is characterized by significant fluctuations in the load of the regime change, depending on the process conditions, the alternation of work periods and breaks. Thus, the load peaks on reversing mills do not last more than 5 or 6 seconds for continuous 25 or 40 sec. Instantaneous overloads exceed the rated power of the engine 2 or 3 times.

Due to the high degree of mechanization of the process of rolling mill installation is required on a large number of

electric motors. The power of electric auxiliary machinery of highly mechanized modern mill reaches several thousand kilowatts.

Mechanization of rolling production is accompanied by a high consumption of electricity, which is the sum of the energy consumed by the main drive and the various mechanisms of the camp:

$$W_{\text{rol}} = (P_{\text{rol}} + R_{\text{dl}} + P_{\text{in}}) t_{\text{rol}}, \text{ kW} \cdot \text{h}$$

where P_{rol} – average power during rolling, including the power spent in idling of mill and converting units, kW;

P_{dl} , the P_{in} – the average power of the mechanisms of long and intermittent modes, kW;

t_{rol} – rolling time, hours.

Mechanisms of long and intermittent modes are auxiliary units of mill designed for mechanization of the rolling process, ventilation systems, various pumping stations, overhead cranes, transport devices, units for cold straightening and finish rolling.

Specific consumption of electricity consumed for the production of rolled products, determined by the formula.

$$E_{\text{rol}} = W_{\text{rol}} / \Pi_{\text{rol}}, \text{ kW} \cdot \text{h} / \text{ton}$$

where Π_{rol} is the number of rolled metal for the settlement period, tons.

Rational use of electricity in the rolling plant should be based on progressive norms of specific energy consumption. Progressive rate of specific energy consumption is technically feasible energy consumption required to produce one ton of ready roll in modern technology and the most advantageous mode of operation of the equipment.

Development of norms specific energy consumption is based on technical and economic calculation, which uses the test results and statistical data on the dynamics of specific power consumption. If the feasibility studies of norms of electricity consumption must be taken into account organiza-

tional and technical measures to reduce energy consumption. It should also take into account the increase or decrease in power consumption depending on the period of the year in the autumn — winter and spring-year-old. Energy-saving mode when rolling is associated with the maintenance of the mill in operation optimal values of heating temperature, the coefficient of friction of the metal, the magnitude of the compression pass and the rolling speed

The composition of section rolling shop of JSC “Uzmetkombinat” includes: linear mill “300”, mill “IIIIC-40–80» -two lines, mill « IIIIC –80–120» -one line.

The structure of the camp «300» includes:

- Crimp line «630» -two stand;
- Roughing line «420» -two stand;
- Fine Line «300» -two stand.

For the heating of the metal under the rolling, have two reheating furnaces with capacity of 50t/h.

On the line «630» blanks for ball mills and Long products are rolled. Ready shapes, sections, after the finishing line enter the pinion refrigerator, which produces cutting to length.

To calculate the specific consumption of electricity by shops of «Uzmetkombinat» accepted design-statistical method that is based on the analysis of statistical data for a number of years prior to the actual electricity consumption, the volume of production and the factors influencing their change.

When calculating the specific energy consumption by types and classes of products accounted for specificity of this shop.

In the rolling plant produced:

- Hot-rolled steel round: close-grade 40 mm, 100 mm and 120 mm.
- Band of hot-rolled steel of general purpose: close-grade 60h12 mm, 50h20 mm, fine-grade 50h5 mm.
- Hot-rolled steel angles, equilateral: fine-grade 25h4 mm, mm 28h4, 30h4 mm, mm 32h4, 40h4 mm.

— balls of steel grinding for ball mills, with a nominal diameter of 68.0 mm and 104 mm.

— Hot-rolled square: the average grade-side 20 mm, fine-grade side 16 mm.

Over the period of 2012 and 2013, it been studied and analyzed and mean-average actual cost of electricity and the production volume at which revealed shifts producing only one range of hire. On the basis of these data, it is determined the average power consumption and the volume of output for each range. It should be noted that due to a slight change of specific indicators of energy consumption related to the range in the production of the specific consumption of varieties accepted. Given this, we analyzed the energy performance separately on assortment and variety of rolling overall.

Below, it is given the calculation of determining the average value of energy consumption by the type of product

$$W_{av} = (W_1 + W_2 + W_3 + \dots + W_n)/n, \text{ kW} \cdot \text{h}/\text{shift}$$

where $W_1..W_n$ — Removable power consumption corresponding to only one type of metal, kWh/shift,

n -number of shifts for which releases one type of metal rolling.

Mean-volume products must conform to the electricity consumption at which the volume was determined mean-power consumption, considered assortment.

$$\Pi_{av} = (\Pi_1 + \Pi_2 + \Pi_3 + \dots + \Pi_n)/n, \text{ t}/\text{shift}$$

where $\Pi_1.. \Pi_n$ — removable volume of produced metal rolling, corresponding to only one type, t/shift.

The average value of the specific energy consumption by the type of product has the form:

$$a_{av} = W_{av}/\Pi_{av} = (W_1+W_2+W_3 + \dots + W_n)/(\Pi_1 + \Pi_2+\Pi_3+ \dots + \Pi_n), \text{ kW} \cdot \text{h}/\text{ton}$$

The following table shows the average monthly value of power consumption, the volume of issuance ball rolling and specific energy consumption by months in 2013.

Table 1. – The resulting values of the specific energy consumption for ball rolling

Range	The average monthly power consumption, ths. kW · h	Average monthly production volume in tons	The average specific energy consumption, kWh/t
Ball rolling Ø 68, Ø 100, Ø 120			
Ø 100	223,97	3555,22	63
Ø 68	534,64	7034,83	76
Ø 120	203,27	4143,41	49
in total	961,88	14733,47	65
average	320,63	4911,16	65
Ball rolling Ø 40			
Ø 40	75,60	504,05	150

The table shows that the value of the specific energy consumption varies within wide limits, not only by types of manufactured products of shop, as well as within the same range. In

particular, the specific energy consumption of the ball marks Ø 40 is more than three times energy-intensive than the specific consumption of ball marks Ø 120

Table 2. – The resulting values of the specific energy consumption for variety rolling

Range	The average monthly power consumption, ths. kW · h	Average monthly production volume in tons	The average specific energy consumption, kWh/t
1	2	3	4
Area 40x4	41,08	331,76	124

1	2	3	4
Area 32x4	19,53	165,54	118
Area 25x4	43,98	318,34	138
Area 35x4	44,58	484,12	92
Area 40x5	27,28	228,96	119
Area 30x5	18,35	1978,99	103
Square 16x16	17,12	160,37	107
Square 20x20	11,70	116,28	101
Band 40x5	25,70	190,24	135
Band 36x6	12,46	200,50	62
Band 40x10	27,33	232,11	94
Band 50x5	8,33	94,62	88

Analysis of the tables shows that the specific energy consumption by types of products is very different. In particular, the specific energy consumption of ball rolling \varnothing of 40 is greater three times than the ball rolling \varnothing 100. Not accounting of energy intensity products range of the rolling mill will lead to inaccurate calculation of energy consumption over the forecast year or accounting period.

Conclusions:

1. It has been established that most of the carbon and low alloy steels decrease the heating temperature during the rolling by 1° C leads to an increase in the specific energy consumption at 0.5–0.8%.

2. Specific power consumption for the production of various types and sizes of the rolling are significantly different and the ratio of maximum to minimum values reaches 70%.

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Section 8. Transport

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The method of evaluation of greenhouse gases emission from car-road complex and its application in estimation of caused losses

Abstract: Evaluation of greenhouse gases emission from car-road complex depending on evenness of road cover is offered. Given equations allow to perform an inventory with modern state of technology of production and repair of transport vehicles and engineering and repair of roads.

Keywords: car-road complex, greenhouse gases emission, environmental damage

Growing progress in environmental pollution causes an anxiety in world science community. A great number of studies are devoted to investigation of possibilities to lower pollution level in different technological processes, as well as to the problems of emissions inventory.

Considerable contribution into the problem of environmental pollution is brought by automobile transport. The main part of pollutions is due to exhaust gases from the engines of transport vehicles. However in the process of operation of motor roads other processes, such as fuel production for automobiles and road machines traffic, production of repair materials, etc. also contribute into environmental pollution. The problem of inventory and evaluation of contribution of these components into total amount of emission of car-road complex (CRC) is not completely studied yet.

A special attention world science community pays to inventory of greenhouse gases emission.

An accountability in greenhouse gases emissions becomes compulsory for many international organizations. International community also demands different organizations to present data on greenhouse gases emissions to estimate beforehand potential economic and financial risks, connected with greenhouse gases emissions. In fact, an accountability on greenhouse gases emissions becomes a norm no less important than evaluation of an influence on environment and control in ordinary polluting substances emissions.

Greenhouse gases are not pollution substances in general understanding of this term. As far as they do not directly influence the health or eco-systems, the inspection is not carried out on concentration of this or that greenhouse gas near industrial enterprise; the inspection is done on absolute values of emissions during rather long time — usually for a year. It

does not matter whether it is a volley emission or a gradual one. An amount of emission for a period of one year is a factual contribution of emission source into global greenhouse effect. Neither global nor regional effect depends on the location of emission.

In this paper the problems of inventory of emissions of CRC, formation of the method of simplified determination of economic damage from environmental pollution in road operation and development of basic mechanism of economic impact of road services at excess emissions are considered.

To solve the problem first of all it is necessary to consider CRC as a complex system, changing within the life cycle (LC) of road. Emissions into atmosphere within the life cycle of road are due to:

- Traffic intensity of transport vehicles;
- Maintenance of roads;
- Current repair works of roads;
- Technical service and car repair;
- Fuel for the traffic of transport vehicles;
- Materials for car repair;
- Materials for maintenance of roads;
- Materials for current repair of roads.

As the amount of emissions varies greatly due to numerous factors, difficult to be taken into consideration, the development of the methods which permit to estimate an amount of CRC emissions in dynamics presents an important issue.

To do this it is necessary to reveal the factor which depends on all components of total emissions of CRC. Such factor may be an evenness of road cover. According to experts assessments [8] a contribution of road component in estimation of car emissions is 10–15%.

In complex evaluation of “road-car” system emissions it is necessary to take into account complex interaction of road and car. Car traffic, moving on road, destroys it; here car damage occurs as well. So, the state of road cover depends on periodicity of technical service and repair of transport vehicles. There exists a rather definite dependence [1] between the state of road cover and periodicity of repair of transport vehicles.

Damage of road occurs due to definite law depending on traffic intensity and climatic factors. To maintain the state of the cover on an acceptable level with given intensity of traffic, a certain number of average repairs of road is necessary. Repairs of transport vehicles and roads are accompanied with harmful substances emissions, which should be accounted in inventory process [2].

We have made an attempt to conduct an inventory of all emissions in “road-car” system during life cycle of road. In order to reveal the dependences between allowable evenness of road cover and an amount of emissions in different stages of life cycle of roads there was conducted a wide-scale computer experiment. To carry out an experiment the following models were chosen:

Road models

1. Model of prediction of road evenness [3].
2. Model, which determines average annual area of cover, subjected to current repair [4].
3. Model, describing smoothing effect of average repair [5].

Transport vehicles models

1. Model of prediction of transport vehicles speed in relation to evenness of road cover [6].
2. Model of prediction of amount of emissions from transport vehicles traffic, depending on speed [7].
3. Model of evaluation of wear intensity of transport vehicles, depending on traffic speed and evenness of road cover [1].

As an **initial data** published results of studies carried out by NAMI, laboratory of Moscow Automobile and road construction institute, Road research institute of Kazakhstan, State JSC Uzavtoyul were taken; they relate to regularities of changes of the state of road cover with time, and an amount of emissions during transport vehicles motion, repair of transport vehicles and road cover, effect of fuel and materials [1; 3; 4; 5; 7; 8; 9].

An experiment presents a variation problem with examination of options of allowable evenness; it includes 9 stages for roads with capital type of road cover and 5 stages for roads with light-weight type. Each stage corresponds to different intensity of traffic. Each stage includes 4–6 options of allowable evenness of cover. Allowable evenness of cover was given from 3,5 IRI (“excellent” according to accepted system of evaluation of evenness during the period of road operation) [10]. Three options were considered as current repairs, used to maintain allowable evenness:

- ✓ surface treatment;
- ✓ thermo-profiling;
- ✓ laying of new layer of asphaltic macadam.

Time of operation of road with capital type of road cover surface is taken as 18 years, with light-weight type — 12 years.

For the experiment traffic intensity options were chosen typical for roads in Uzbekistan (according to data presented by State JSC “Uzavtoyul”).

As a result of experiments:

- ✓ correlation dependence between evenness of road and amount of emissions was established;
- ✓ an equation to determine an amount of emissions, depending on evenness under certain intensity of the traffic was derived;
- ✓ optimal values of evenness with minimal emissions observed, were found.

Results of experiments were subjected to statistic treatment. On the example of greenhouse gas CO₂ for the option of “surface treatment” repair 2-factor dispersion analysis was carried out:

Factor A — evenness (4, 6, 8, 10 IRI);

Factor B — traffic intensity (3000, 4000, 5000, 6000, 7000, 9000 cars per day at each value of evenness).

As an iteration, the following emissions were taken: 1) exhaust gases of transport vehicles, 2) technical maintenance and vehicles repair, 3) fuel production, 4) material production for technical maintenance and repairs.

1-factor analysis “evenness — emissions” for each option of traffic intensity was carried out. Dispersion analysis shows statistic reliability of the dependence of emission amount on evenness of road cover.

Stated dependences permit us to work out the methods of inventory of emissions of CRC, based on data of monitoring of the state of motor roads. That is, knowing the evenness of road cover and traffic intensity on the roads of a given category, we may determine average annual amount of emissions per 1 kilometer of road.

Emissions from all above mentioned sources are divided into 3 groups: 1) greenhouse gases, 2) emissions in roadside zone, 3) local pollution.

“Greenhouse gases” are emissions (CO₂, CH₄ and N₂O) from all sources.

“Emissions in roadside zone” include emissions from moving transport vehicles and ones from repair works on the road.

“Local pollution” is an emission from repair works of transport vehicles and material production (emissions of industrial enterprises).

On the basis of results obtained in experiments the conclusion was drawn that by each value of traffic intensity there exists optimal evenness with minimal emissions. With improved quality of the road cover CO₂ emissions at low intensity of traffic are increasing; this is explained by greater expenditure of force on greater velocity.

Based on experimental data in «MATLAB» medium a choice of equations was done to express the dependence “CO₂ emissions — traffic intensity” under different values of evenness of road cover.

All curves are described by equations of the 2nd degree, which may be presented in general form:

$$m_{CO_2} = A \cdot N^2 + B \cdot N + C \quad (1)$$

Equation coefficients A, B and C change depending on evenness (Fig. 1).

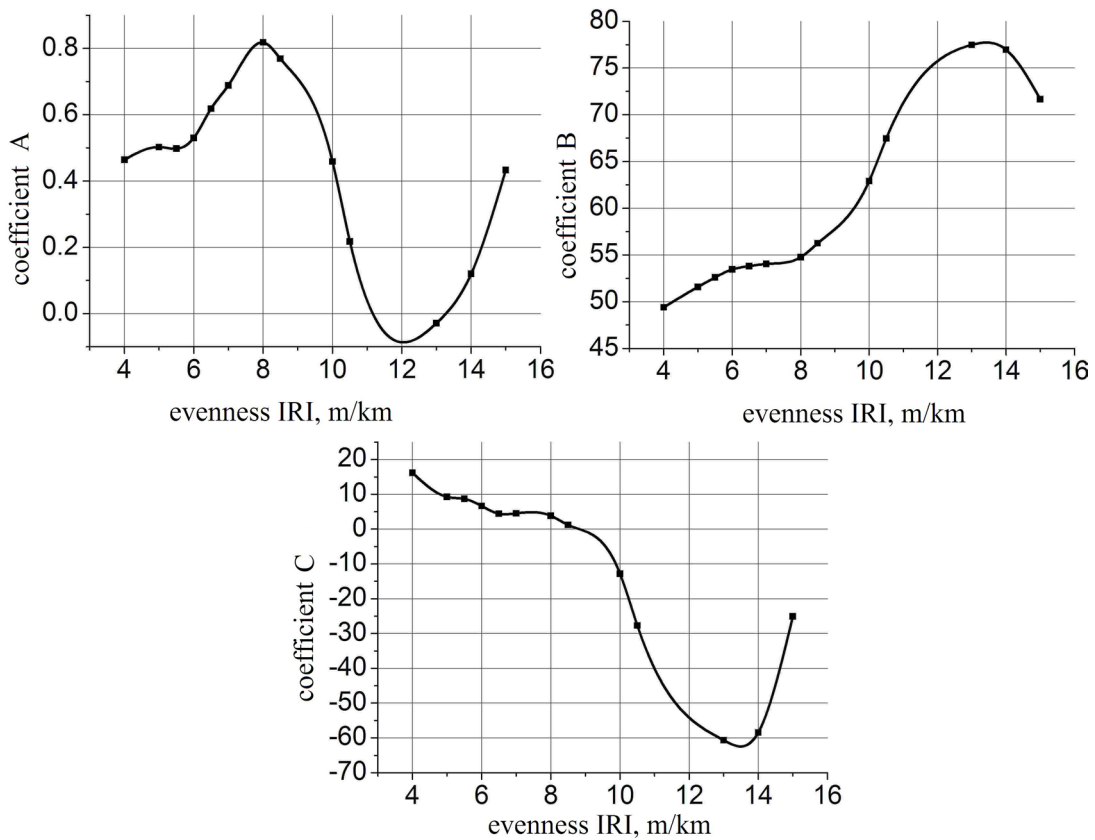


Fig. 1. Change of coefficients A, B and C depending on evenness

As we may see the curves have a complex form. An attempt to choose power functions of these graphs with MATLAB and ORIGIN programs gives rather great error, so for mathematical description of these curves we will use interpolations.

Taking a number of values of evenness and describing obtained dependences with Newton's interpolation polynomial we will define coefficients A, B and C of equation (1) for any values of evenness. As a result of substitutions and calculations we derive equations for coefficients:

$$\underline{\mathbf{A}}: y_1 = -0,000008688 x^8 + 0,000585373 x^7 - 0,017016784 x^6 + 0,279385699 x^5 - 2,836359632 x^4 + 18,21080871 x^3 - 71,97313455 x^2 + 159,4341975 x - 150,497783 = A \quad (2)$$

$$\underline{\mathbf{B}}: y_2 = -0,000038605 x^8 + 0,0035213 x^7 - 0,129120942 x^6 + 2,527767264 x^5 - 29,17135835 x^4 + 204,573212 x^3 - 855,9080764 x^2 + 1963,566667 x - 1849,876144 = B \quad (3)$$

$$\underline{\mathbf{C}}: y_3 = -0,000733432 x^8 + 0,04751178 x^7 - 1,308293548 x^6 + 19,99653795 x^5 - 185,6542291 x^4 + 1072,386057 x^3 - 3763,169261 x^2 + 7327,045842 x - 6034,965189 = C \quad (4)$$

With expressions (2), (3), (4) CO₂ emissions may be determined at any value of evenness of road cover (in given limits) and traffic intensity with equation (1), where N — is

an intensity of traffic, thousands of cars per day.

Equations for roads with light-weight type of cover are derived by similar way.

$$\underline{\mathbf{A}}': y_1 = -0,025844696x^5 + 1,260701208x^4 - 24,0599029x^6 + 223,9966392x^2 - 1015,16234x + 1791,801901 = A \quad (5)$$

$$\underline{\mathbf{B}}': y_2 = 0,119602 x^5 - 5,827709 x^4 + 111,110845 x^3 - 1033,391737 x^2 + 4680,505456 x - 8198,840181 = B \quad (6)$$

$$\underline{\mathbf{C}}': y_3 = -0,09864335 x^5 + 4,744248895 x^4 - 89,42294478 x^3 + 823,812271 x^2 - 3703,244415 x + 6501,290406 = C \quad (7)$$

The equations to estimate emissions of other substances may be derived by similar way.

Equations to estimate emissions obtained as a result of numeric analysis were subjected to experimental check-up. As far as to conduct full in-situ check-up of results obtained

seems not possible (for example it is impossible to check the change of emissions during repair works, fuel and materials production depending on evenness of road cover), a partial check-up of results has been done, namely, the study of dependences of emissions from moving vehicles in roadside zone on

evenness of road cover.

Results of experiments were subjected to statistical treatment in order to:

— check-up statistic reliability of results of in-situ experiment

— compare results of computer and field experiments

Two-factor dispersion analysis was conducted on two factors:

Factor A — evenness (6, 8, 10, 13 IRI)

Factor B –traffic intensity (4, 8, 12, 16, 20 thousands of cars per day)

As an iteration results of: a) computer and b) field experiments were accepted Dispersion analysis confirmed statistic reliability of the dependence of chosen index of emissions on evenness of road cover and traffic intensity. The degree of the effect of evenness is 46,6%, that of intensity — 50,1%.

The difference 0,9585 between average values in iterations appeared to be less than least essential difference (by Student's criterion) $H_{0,95} = 1,265977$.

So, the difference between results of field and computer experiments may be neglected and it may be possible to consider that they follow one and the same law. Besides, as far as results of field experiments are similar to computer ones, we may conclude that the use of obtained equations to predict emissions depending on road evenness is justified.

According to results of carried out studies, an information about all types of emissions depending on evenness of roads and different traffic intensity, has been obtained. This information may be used in practice to construct the systems of monitoring and inventory of emissions of car-road complex, as well as to assess the loss, caused to environment by car-road complex.

At present there does not exist any unique method to estimate the loss, caused to environment by car-road complex; however there do exist general methods to estimate economic loss due to environmental pollution. Studies in direction of development of a unique method of estimation of damage caused by greenhouse gases are carried out by many researchers. In Republic of Uzbekistan regulation of fines for negative effect on surrounding environment is defined by the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan, on 01.05.2003, No 199 “On improvement of the system of payments for environmental pollution and waste allocation on the territory of the Republic of Uzbekistan” and Regulation “On the procedure of application of compensation payments for environmental pollution and

$$m_{CO_2}^{IRI 6} = 0.5297 \cdot 10^2 + 53.4463 \cdot 10 + 6.6314 = 594.064 \text{ ton/year} \cdot \text{km}$$

$$m_{CO_2}^{IRI 10} = 0.4585 \cdot 10^2 + 62.7562 \cdot 10 - 12.8252 = 660.5868 \text{ ton/year} \cdot \text{km}$$

An excess of emissions is $EE = 66,52 \text{ ton/year} \cdot \text{km}$.

If to take price index from the effect of greenhouse gas CO_2 according to European methodology [11] as equal to 3,33currency unit/ton, we will get excess emissions in terms of money equal to 221,5 currency unit/year·km.

waste allocation on the territory of the Republic of Uzbekistan” on 01.05.2003. However in these documents car-road complex is not considered on the whole as a resource of pollution in determination of compensation payments. According to data of State Committee on nature protection an estimation of the effect on environment is conducted for transport sector only.

Following the interconnection between the quality of road cover and economic loss from pollution will help to increase the responsibility of JSC “Uzavtoyul” enterprises in a quality of maintenance and road repair by introducing the system of taxes and fines. An evaluation of a loss caused by car-road complex on the whole, will allow to correct the rates of compensation payments; this will have a considerable impact on the budget of the Republic.

It should be also noted that though the studies have been performed for conditions of the territory of Uzbekistan, worked out method of estimation of environmental damage from car-road complex may be used in any other region.

Economic loss from environmental pollution on road operation directly depends on the state of road cover (evenness). Knowing the values of evenness of road cover and traffic intensity we may conduct an inventory of emissions and to estimate economic loss from environmental pollution by greenhouse (and other) gases from car-road complex on the whole.

Consider results obtained on the example of emissions of greenhouse gases CO_2 at the motion and maintenance of cars and repair of roads; traffic intensity is $N=6000$ cars per day, average road repair is taken as surface treatment.

Data on monitoring of evenness of road cover was suggested as a basis to conduct an inventory of greenhouse gases. Normative ground for emissions monitoring should be the system of estimations of the state of cover, accepted in the country. If the evenness of road cover is evaluated as satisfactory, greenhouse gases emissions should be also evaluated as satisfactory ones, that is, acceptable ones. If the evenness is evaluated as bad, it may be considered that greenhouse gases emissions excess an acceptable level.

As shown above, mathematical dependence of different gases emissions from car-road complex on road cover evenness is expressed by equation (1). Equation (1) allows to estimate an excess of actual emissions relative to some acceptable (satisfactory) level.

Let us assume that satisfactory evenness is IRI 6, and actual evenness is IRI 10. Estimate an excess of CO_2 emissions at intensity $N = 10$ thousands of cars per day.

In similar way excess emissions of other gases may be estimated and an amount of total sum of additional losses could be assessed.

In Uzbekistan “excellent” evenness corresponds to IRI 4. Assuming an amount of emissions at IRI 4 for each value

of intensity as equal to 100%, we will determine the difference in emissions under other values of evenness, comparing

with IRI 4.

Curves built on these results are shown in Figure 2.

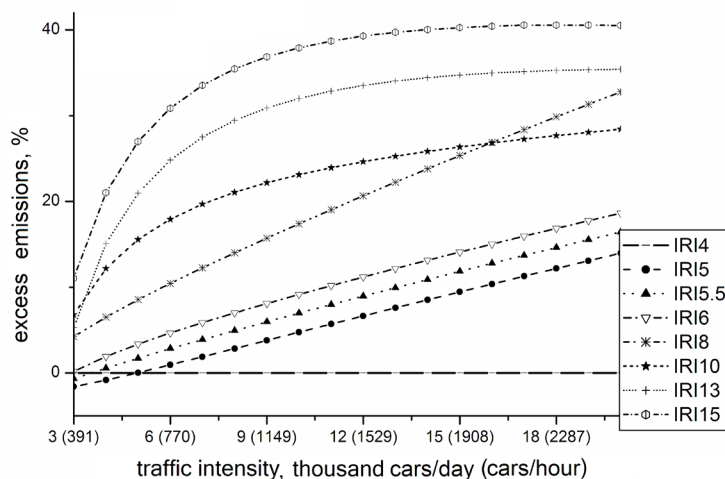


Fig. 2. Graph of excess emissions at traffic on roads with different evenness comparing with IRI 4

Knowing traffic intensity and evenness of road cover on studied section of road and having this graph one may easily estimate excess emissions and calculate economic loss caused.

Conclusion.

1. Evenness of road cover may serve as a criterion for estimation of an amount of greenhouse and other gases emissions.
2. Worked out method of inventory of greenhouse (and other) gases emissions caused by car-road complex, based on results of monitoring of evenness of road cover allows to estimate not only total amount of emissions, but to reveal excess emissions relative to some acceptable level as well.
3. Excess emissions in terms of money estimates the amount of additional damage caused to environment. This

sum may present the basis for estimation of penalty size, imposed on road services which are responsible for excess emissions; further this may serve as an instrument of regulation of environmental pollution.

A general principle of possible mode of inventory is considered in this paper. Given equations allow to perform an inventory with modern state of technology of production and repair of transport vehicles and engineering and repair of roads. With improvement of these processes emissions would change as well. However, using proposed principle and having data on emissions, it is possible to derive the equations similar to (1) for general estimation of emissions.

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Section 9. Physics

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Reflection on time paradox in the special theory of relativity

*“You think everything is so simple?
Yes, everything is simple. But it is not so at all...”*

Albert Einstein

Abstract: It is demonstrated that speed of light doesn't depend on the speed source and is always constant only in terms of the system itself «light source — light receiver» irrespective of the speed of movement of this system relatively other systems. Speed of light relatively other systems is equal the algebraic sum of the constant speed of light in terms of the system itself «light source — light receiver» and the speed of this system relatively other systems. At time synchronization within the objects, moving relatively each other evenly and rectilinearly, time paradoxes are impossible. A postulate about equal speed of light relatively objects, moving evenly and rectilinearly relatively each other, can be considered as an accurate one. Conclusions about that the time within the systems, moving relatively each other, flows differently, and the objects' sizes change depending on the speed of these objects, are wrong too.

Keywords: Theory of relativity, speed of light, time synchronization, time paradoxes, objects' sizes, theory inaccuracy.

Introduction

Contemporary theoretical physics is mostly based on the main postulate of the special theory of relativity, which confirms, that speed of light has a constant value towards all objects and doesn't depend on the speed of movement of these objects relatively each other, if they move in the space evenly and rectilinearly.

A consequence of this statement is a conclusion about impossibility of time synchronization in the objects, moving relatively each other, that is why the time on these objects will flow differently.

To make our further reasoning more clear, let's take our variant of time paradox explanation, which follows the statement confirmed.

All attempts to prove this statement were made at the beginning of forming of physics as a fundamental science. It became clear for scientists a long time ago, that if an object moved evenly and rectilinearly, and an observer was settled inside this object, it was completely impossible to detect, that the object moved in the space, — so, for the observer inside, the object could be considered as motionless. From the other side, it seemed evident that speed of light in the space had always had the same value. Thus, a conclusion was made, that speed of light didn't change relatively to all objects; these objects moved relatively each other even along with ray of light.

Important premises for the elaboration of the theory of relativity were results of famous experiences of Michelson-

Morley to detect an air. Simply these experiences can be described in a following way. Earth is moving around Sun with the speed of nearly 30 km/sec. If to establish on a surface of Earth a horizontal platform with a source and a receiver of light, oriented perpendicularly to the direction in the Sun, and turn this platform on 180°, the light source and the light receiver will replace each other.

Investigators supposed to think that in one case speed of light will be put with speed of Earth around Sun, and in another case — it will be deducted. Speed of light was measured by the most exact device for that moment — an interferometer. However, the change of speed of light wasn't detected. Despite the fact, that these experiences were conducted with an aim to prove the air existence (or its absence), creators of this special theory of relativity interpreted the results of these experiences in their own way, namely: the experiences proved that speed of light is the same for all the objects irrespective of their movement relatively each other.

Let's imagine that we're on the object, which we conditionally call “maternal”, and that the length of this object is equal to the distance, which ray of light passes for 1 second, i. e. 300 000 km. Let's also imagine that on the left side of the object there is a source of ray of light, and on the right side — a receiver. It is obvious that ray of light on the “maternal” object passes the distance from the source to the receiver for 1 second.

Further let's imagine that from the “maternal” object in the direction from the light source to the light receiver ex-

actly the same object is sent into the space (let's conditionally call the object "childish") with the speed, equal to speed of light. For observers, who are settled on the "maternal" object, it is obvious that ray of light of the "maternal" object, having caught up the "childish" object, will pass the distance from the very beginning till the end of the "childish" object for 1.5 seconds.

However, if we take the considered postulate for the truth, for observers on the "childish" object speed of light will also be equal to 300 000 km/sec., and the light will pass the distance from the beginning till the end of the "childish" object for 1 second. Thus, time on the flying away "childish" object must pass more slowly than on the "maternal" object. The famous "paradox of twins" is based exactly on this conclusion.

Let's consider the above mentioned from the critical point of view.

1. Formulation of the postulate contains the limit of its implementation, in particular: if objects move evenly and rectilinearly. To our opinion, this is such a serious limit of its implementation, so that this postulate simply has nothing to implement to, because contemporary science in the studied world doesn't know objects, which could ever move evenly and rectilinearly. Impossibility of the uniform and rectilinear movement is connected with the circumstance, that gravitational fields, which are penetrating the space, impact all the objects without exception (including photons — components of light), bending the trajectory of their movement.

2. It is well known, that ray of light consists of separate material pieces — photons. Let's imagine, that ray of light consists of two photons. If we take the confirmation of this postulate as a truth one, — in this case one photon must move with the speed of 300 000 km/sec. relatively another one, but this is obvious absurdity.

3. We have considered the case, when the "childish" object was moving away from the "maternal" object with the speed, equal to half speed of light, and we have come to a conclusion, that, according to the postulate, time on the removing object must flow more slowly.

And what will happen, if the "childish" object is not removing, if it is coming closer to the "maternal" one with the same speed? Following the logic, we must admit, that in this case the time on the "childish" object must flow faster. The special theory of relativity doesn't contain any explanations to this, because the light in this postulate has no vector.

4. Let's consider the method of Michelson-Morley's experience from the point of view of the scientific right of using the experience's results as a proof of speed of light constancy towards any objects, moving relatively each other.

Let's imagine the system "trunk-bullet-object" (the first system). The object is situated in 1 km distance from the trunk cut. The speed of the bullet is 1 km/sec. The system is motionless relatively Earth surface. However, in the space the system moves by the complicated trajectory: along with Earth surface relatively the axis of rotation of Earth, along with the Earth around the Sun, along with the Solar system relatively the con-

ditional center of the rotation of galaxy Milky Way and etc.

For the observer, which is situated directly in the system, the system will be perceived as motionless. The time of the bullet's passing the distance between the trunk cut and the object will always be 1.0 sec. independently the orientation of the system relatively, for example, the Sun. As a consequence — the speed of trunk, bullet, coming out of the trunk, and the object, is equal to the sum of all speed of system's movement by this complicated above mentioned trajectory.

Let's imagine one more (the second) system trunk-bullet-object, which is moving far away from the first system with the speed of 0.5 km/sec. The time of the bullets' passing the distance between the trunk cut and the object in the second system will also be 1.0 sec. If the bullet of the first system catches up the second system, for this bullet the time of passing the distance between the trunk cut and the object will be 1.5 sec. However, it doesn't tell us about that the time in the second system flows differently than in the first system.

It is also clear that no matter how we try to orient the system trunk-bullet-object relatively the Sun (if we add to the speed of the bullet's movement the speed of Earth movement around the Sun or if we subtract it) the speed of the bullet's movement will be also the same *in terms of the system itself*.

Photon is a material piece and doesn't differ from the bullet in this sense. So, these arguments spread out on a photon too. From this point of view it becomes clear that famous experiences of Michelson-Morley with light (cluster of photons) gave the same results, if they would have been conducted with the system trunk-bullet-object.

So, we can confirm, that speed of light *is* always **constant only in terms of the system itself "the source-receiver"**, but relatively any other system to speed of light will be added or will be subtracted the speed of *the system itself* relatively **any other system**.

So, for example, for an observer, who is on the Sun, a ray of light, coming from the Earth surface in the direction of Earth movement relatively the Sun, will have the speed of 300 000 km/sec. plus 30 km/sec.

5. Let's separately consider a question about possibility of synchronization time in the objects, moving relatively each other.

The speed of light is not its unique characteristic. Ray of light consists of separate pieces — photons (a photon is a single electromagnetic impulse). Photons are characterized by frequency, energy, vector of movement direction, angle of rotation of polarization plane and etc.

Let's consider the possibility of time synchronization in conditionally motionless "maternal" object and in the "childish" object, moved from the "maternal" object into the Space. If the "maternal" object is to be directed towards the "childish" object, ray of light with the defined frequency, on the "childish" object will be easily defined its speed relatively the "maternal" object by changes in the light frequency (Doppler's effect).

We think, that time synchronization on the "maternal" and "childish" objects is possible without ray of light using.

For example, the speed of the “childish” object and its position in the Space can be defined after estimation of changes of parameters of gravitational fields, penetrating the Space. It is also possible to synchronize the time, using such a fundamental characteristic of the material — a period of the radioactive substance half-decay. We mean that the radioactive substance is falling into pieces with the equal speed independently the object’s speed of movement, on which this substance is located.

Nowadays it is obvious, that electromagnetic impulses of any origin move with speed of light.

We conducted an experience on detection of the speed of electromagnetic impulses in coaxial cable. The experience was made by the following scheme:

— a generator of electric impulses of rectangular form was set up on the generating of a signal with an amplitude of 5 W, duration of 0.1 μ s and frequency of 1 kHz;

— impulses were given at the same time at entrance of the coaxial cable of 300 m length, put in the bay, and at the first entrance of a two-lead oscilloscope;

— impulses were given from the exit of the coaxial cable on the second entrance of a two-lead oscilloscope.

The period of time, which was observed between the forward front impulses, reflected on the first and the second channels of the, was 1.0 μ s, — it corresponds to the speed of movement of electromagnetic impulses in coaxial cable approximately 300 000 km/sec.

Any mechanical influences on the cable (unfolding of the cable, influence of the vibrations, temperature and etc.) didn’t lead to the change of the observed period of time. So, we can make a conclusion, that cable, moving along with the object, on which it is fixed, can be a synchronizing element of measuring instrument of time on the “maternal” and “childish”

objects. As a generator of impulses it is reasonable to implement a scintillation detector of gamma-quants of Space. At functioning together with the photoelectron multiplier the scintillation detector will generate an electronic impulse at each penetration of gamma-quant into the sensitive field.

The second important conclusion is that on the object, which moves relatively a motionless cable (a material carrier of the electromagnetic impulse) can be detected a geometrical point, which corresponds to the time of appearance of impulse at the exit of the cable. Thus, the indicated geometrical point will be displaced depending on the speed of movement of the object relatively the motionless cable. This conclusion is so obvious that it doesn’t require experimental confirmations.

Conclusions

1. A postulate about the equal speed of light relatively the objects, moving relatively each other evenly and rectilinearly, apparently, can be considered as a mistakenly one.

Respectively, also are wrong the conclusions about that the time, in the systems, moving relatively each other, flows differently, and about that the sizes of the objects are changing depending on the speed of these objects.

2. A number of ways to synchronize the time on objects, moving relatively each other, exists. On such objects at time synchronizing paradoxes of time are not possible.

3. The speed of light doesn’t depend on the speed of the source and always is constant only in terms of the system “the light source — the light receiver” itself, independently the speed of movement of this system relatively other systems (objects).

Speed of light relatively other systems (objects) is equal to algebraic sum of constant speed of light in terms of the system “the light source — the light receiver” itself and the speed of this system relatively other systems (objects).

Section 10. Philology and linguistics

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Functional-semantic field of shall/will in the Old English period

Abstract: This scientific article is devoted to the study of shall/will semantics in Old English time. In order to understand the current state of the language, it is necessary to regard each phenomenon of the modern language as a result of a long historical change, development and transformation. The issue of meaning and function of will/shall in ancient and modern English is of great interest in theoretical grammar.

Keywords: sculan, willan, shall, will, modal verb, diachrony, future tense, Old English period, semantics.

Paradigm of the English verb in Old English period had such structure in which all verbs were divided into several morphological classes and had various ways of forming. It should be noted that all forms of the verb in Old English period were synthetic. The analytical forms began to appear at the end of the Old English period. In course of time the verbal system of the English language continued to grow due to the fact that new categorical forms had appeared. Exactly at this time, the verb system had the following features:

1. the category of number: singular, plural
2. the category of person: first, second, third
3. the category of mood: indicative, imperative, subjunctive
4. non-finite forms of the verb: infinitive, first participle, second participle
5. the category of time-present, past [1,75].

As follows from the verb structure, we see that there were only two forms in Old English: forms of the present tense and forms of the past tense. As for the future time, future actions were expressed by the forms of the present tense depending on the context. Thus, the present and the future were expressed by one form — the form of the present tense.

Foreign and domestic scientists Fowler H. W. (1908), Ilyish B. A. (1968), Smith J. J. (2009), Wardale E. E. (1922), Smirnitky A. I. (1965), Quirk R. (1955), Ivanov I. P. (1999) and Hogg R. (2002) were engaged in the history of formation of the future tense.

Contextual qualifiers played an important role in relating actions to the future time. Context usually prompted the idea of the future time. To understand, let us take some examples from the Old English period, where future time was expressed by the forms of the present tense:

(1) 'Ic mē mid Hruntinge dom zewyrce oþðe mec deað nimeð' (OE)

I will win glory by the sword or death will take me (MnE) (Ilyish B. A.)

(2) 'On morgenne, ga ic tō pæm dunum' (OE)

In the morning I will go to the mountain (MnE) (J. Smith)
(3) 'Ic arise and ic fare tō minum fæder' (OE)

I will raise and go to my father (MnE) (Wardale E. E.)

The idea of the future time in the above examples suggests marked verbs.

Here is an Old English extract "Joshua and the Battle of Jericho", where the future time is expressed by the form of the present tense:

(1) 'Hierichō sēo burch wæs mid weallum ymb — trymed and fæste beloun. Drihten cwæp Ðā tō lōsua, 'Ic dō Ðās burch Hierichō on pinum gewælde and pone cynning samod and pāstrengstan weras Ðe wuniap in Hierichō' (OE)

Jericho city was surrounded by walls and firmly fenced. The Lord said to Joshua, "I will give the city to your rule together with the King and the strongest man in the city of Jericho" (MnE) (Hough C.)

Thus, marked verbs suggest the idea of the future time without having a special form in all the examples and special time indicator.

The next stage of future tense development in the Old English period was formation of the new way of expressing future time arising from combination of modal verbs with infinitive. Among such modal verbs were "willan" (modern "will") and "sculan" (modern "shall") with infinitive. The Old English modal verbs "willan" and "sculan" are recorded in the earliest written sources and characterized by a high frequency of use in this time.

The peculiar feature is semantic development of these verbs. It is important to note that minds of researchers about the ability of these constructions to express modal "pure" future time are different. According to some researchers, such as Smirnitky A. I., these constructions which were used for the transmission of the future time could have more or less vivid temporary meaning. According to Smirnitky A. I., these constructions did not indicate future actions because instead of future actions the present tense was used.

It is necessary to pay attention to the full form of conjugations of the Old English verbs “willan” and “sculan” in num-

bers and persons that are presented in tables 1 and 2:

Table 1. – Form of conjugation of the Old English verb “sculan” in numbers and persons

Sculan — obligation				
Person	Indicative mood		Subjunctive mood	
	Present	Past	Present	Past
Singular				
1	<i>sceal (l)</i>	<i>sc (e)olde</i>	<i>scu (y)le/sceole</i>	<i>sc (e)olde</i>
2	<i>scealt</i>	<i>sc (e)oldest</i>	<i>scu (y)le/sceole</i>	<i>sc (e)olde</i>
3	<i>sceal (l)</i>	<i>sc (e)olde</i>	<i>scu (y)le/sceole</i>	<i>sc (e)olde</i>
Plural				
1	<i>sculon</i>	<i>sc (e)oldon</i>	<i>scu (y)len/sceolen</i>	<i>sc (e)olden</i>
2	<i>sculon</i>	<i>sc (e)oldon</i>	<i>scu (y)len/sceolen</i>	<i>sc (e)olden</i>
3	<i>sculon</i>	<i>sc (e)oldon</i>	<i>scu (y)len/sceolen</i>	<i>sc (e)olden</i>

Table 2. – Form of conjugation of the Old English verb “willan” in numbers and persons

Willan — willingness						
Person	Indicative mood		Subjunctive mood		Negative form	
	Present	Past	Present	Past	Present	Past
Singular						
1	<i>wille</i>	<i>wolde</i>	<i>wille</i>	<i>wolde</i>	<i>nelle</i>	<i>noalde</i>
2	<i>wilt</i>	<i>woldest</i>	<i>wille</i>	<i>wolde</i>	<i>nelt</i>	<i>noalde</i>
3	<i>wil (l)e</i>	<i>wolde</i>	<i>wille</i>	<i>wolde</i>	<i>ne (y)le</i>	<i>noalde</i>
Plural						
1	<i>willað</i>	<i>woldon</i>	<i>willen</i>	<i>wolden</i>	<i>ne (y)llaþ</i>	<i>noldon</i>
2	<i>willað</i>	<i>woldon</i>	<i>willen</i>	<i>wolden</i>	<i>ne (y)llaþ</i>	<i>noldon</i>
3	<i>willað</i>	<i>woldon</i>	<i>willen</i>	<i>wolden</i>	<i>ne (y)llaþ</i>	<i>noldon</i>

By verbs “willan” and “sculan” conjugation we see that these verbs are conjugated and have specific endings in second-person singular in present and past tense. The table has an additional form — negative form. It should be noted that in the Old English period the particle ‘-ne’ was used for the negative form of the verb “willan”. As a result ‘-ne’ merged with some modal verbs and formed one word, for example, ne + wille = nelle/nylle. As for the modal verb “sculan”, the particle ‘-ne’ was also used for the negative form but not by merging, namely in usual way as the other modal verbs “ne sceal”.

It should be noted that “sculan” and “willan” as modal verbs retain their lexical meaning. The verb “sculan” is used in the sense of obligation, the verb “willan” is used in the sense of willingness and intention to perform an action, since the Old English “willan” and “sculan” were called as ‘preterite-present verbs’, as we noted above, they were among modal verbs. Based on this statement, we will give examples from the Old English period of the modal verb “sculan” with its lexical meaning of obligation:

(1) ‘Ic sceal rædan tō merigen’ (OE)

I have to read tomorrow (MnE) (J. Smith)

The verb “sceal” in these examples with the ending of first-person singular accentuates an obligation to perform an action.

(2) ‘Swā sceal man dōn’ (OE)

In this way people should behave themselves (MnE) (Ilyish B. A.)

(3) ‘Dēos bōc sceal to Wiozoraceastre’ (OE)

This book must be directed to Wuster (MnE) (M. Lehnert)

The verb “sceal” in the sentence having the ending of third-person singular shows the meaning of obligation.

The following examples are taken from Anglo-Saxon dictionary:

(1) ‘Forþæm ne scyle nan wis man nænne mannan hatian’ (OE)

People should not hate another people (MnE)

The verb “scyle” is used in the negative form to express obligation.

(2) ‘Nu sceal he sylf faran’ (OE)

Right now he has to go (MnE)

(3) ‘Seo gesceadwisnes sceal wealdan pæs yrres’ (OE)

Anger should serve as reason (MnE)

(4) ‘He sceal geþolian manige gearfoðu’ (OE)

He must overcome difficulties (MnE)

The verb “sceal” having the ending third-person singular also shows the meaning of obligation.

Let us turn to the Old English modal verb “willan”, having in its meaning the shade of volition, intention and desire to perform an action:

(1) ‘Ic wille wyrcean min setl’ (OE)

I want to take the throne (MnE) (R. Quirk)

The verb “wille”, having the ending first-person singular shows the meaning of obligation.

(2) ‘He wile eft 3esettan heofona rice mid hluttrum saulum’ (OE)

He will want to create the heaven kingdom with the help of pure souls (MnE)

The verb “wile”, having the ending third-person singular shows the meaning of volition and desire.

(3) ‘Nylle ic ðæs synfullan dēað, ac ic wille ðæt hēgecyrre and lybbe’ (OE)

I do not want the death of this singer, I want him to come back and live (MnE)

The form “nylle” comes from the negative form “will not”, and the verb “wille”, having the ending first-person singular, shows the meaning of desire of the speaker. It should be noted that the verb “willan” in this sentence can be used without infinitive.

Smith J. gives examples where lexical meanings of volition and obligation of these verbs are shown:

(1) ‘Ic wille gān’ has the meaning of ‘I want to go’, not ‘I will go’

(2) ‘While hēo sceal gān’ has the meaning of ‘She must go’, not ‘She will go’

The following examples are also taken from Anglo-Saxon dictionary:

(1) ‘Sam we willaþ sam we nyllaþ’ (OE)

Either we go or not (MnE)

In this sentence the verb “willan” is used in affirmative and negative forms. The verb “willaþ”, having the ending first-person plural shows the meaning of intention, the verb “nyllaþ” is used in negative form.

It should be noted that in the late of the Old English period the number of modal constructions ‘sculan/willan + infinitive’ in the sense of future tense increases but with minimal sense of modality, for example:

(1) ‘Ic eow tō sōðe seczen wille abd þæs in life ne wyrðeð’ (OE)

I will tell you the whole truth, that there is something unworthy in life (MnE)

(2) ‘Ne ðearfhē hoþian nō þystrum forðylmed ... of þām wyrmsēle, ac ðær wunian sceal āwa tō alder’ (OE)

He dare not hope to defeat the darkness of hell, but he will live there forever (MnE) (Ivanov I.P.)

According to Ilyish B.A. the meaning of ‘obligation’ can sometimes be less visible that sentence or context relates action to the future time, for example:

(1) ‘Ic þæm zōdan sceal for his mōd-þræce māðmas bēodan’ (OE)

I would suggest this brave man the treasure for his courage (MnE)

(2) ‘Sceal hriznaca ofer heafu brinzan lāc and luf-tācen’ (OE)

The ship will bring gifts and love through the sea (MnE)

In these sentences the verb in the sense of obligation does not have a clear lexical meaning, i.e. the meaning of “obligation” is slightly weakened, so this verb acquires the meaning of future time. The same weakening can be observed with the verb “willan”, for example:

(1) ‘Hyde sē-þe wylle’ (OE)

Let someone hide who wants (MnE)

(2) ‘Ic þæs wine Deniza, frēan Scildinza frinan wille’ (OE)

I will ask about that my friend Mr. Skildingov (MnE) (Ilyish B.A.)

These examples have a similar explanation. The verb with the meaning of volition, intention and desire to perform an action does not have a clear lexical meaning, so the context acquires the meaning of future time.

In summary we note that our own observations and special studies of the verbs “shall” and “will” in the Old English period showed that one of the way of relating actions to the future time was modal constructions “sculan + infinitive” in the sense of obligation and “willan + infinitive” in the sense of volition, intention and desire. But the main way of relating actions to the future time was the form of the present tense, that is the present and the future expressed one form. Contextual and lexical components of a sentence showed the idea of the future time.

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From mimesis to demiurgia: aesthetic renovation of traditional poetics in the english renaissance novel

Abstract: the article deals with the problem of the genesis of the English Renaissance novel. The basic approaches to the genre modification in question are analyzed in the light of their connection with the general epistemological and methodological tendencies predetermining the dynamics of the literary criticism. It is clarified that the contradictory historical and literary reputation of the Elizabethan long-form narrative manifesting in the dilemma of the genre start and its false-start was established on the ground of the identification of the novel genetic model and its structural matrix. The creative experiments of Shakespeare's contemporaries focusing their literary activity on the renewal of the romance are examined in their connection with the transformations of the Renaissance artistic consciousness revealed on the base of the correlation between the recent historical-poetological conceptions and ideas of the structural theoretical poetics.

Keywords: genesis, romance, novel, Renaissance, poetics, rhetoric, mimesis, demiurgia.

Revealing the correlation between the aesthetical worldview criteria newfound in the course of the romance renewal occurred in the Elizabethan era (1558–1603) and the principles of creative activity established in the epoch of traditionalism initiates the going out of the scientific thought focusing on the English Renaissance novel of the limits of genre reflection verifying the logic of its genesis by the order of its structure. Such a shift of the retrospection determining the vision of the genre in the academic history of the novel forms the preliminary outcome of examining the ambivalent genre status attributed by it to the Elizabethan modification of the novel as a sign of non-coming out the deadlock of its study predicted by the reversion of the primary theoretical approach to this genre supposing the comprehension of its form in the light of the formation of the romance and the novel.

In this area of the genre meta-narration the scientific discussion about the English Renaissance novel inspired by the opposition of “the genre start” (J. Jusserand) [1] and “the genre false start” (E. Baker) [2] arisen as a dilemma of its definition at the turn of the nineteenth century [3] is to be continued against the background of the recent historical-poetological typologies of artistic consciousness (S. S. Averintsev, M. L. Andreev, M. L. Gasparov, A. N. Grintser, A. V. Michaylov [4]) supporting the genealogical study of literature by unfolding the dynamics of the interaction of its main sources forming the literary creative intentionality and manifesting in the concepts of style, genre and author. Discovering the transmission of the poetical dominant in the history these conceptions draw attention to the variety of superposing modal, thematic and formal parameters of the genre formation defined in the great syntheses of the literary theory — from Plato and Aristotle to G. Hegel and M. M. Bakhtin — summarized in the theoretical poetics of structuralism founded by J. Jennette in the course of developing the idea of the architext [5].

Actualizing the epistemological premises of the literary criticism connected with the mainstream of the methodological innovations in the modern humanitarian study stimulated by “post-metaphysical” (J. Habermas) epistemology [6; 7] such an emphasis on the aesthetic dimension of self-other relationship displaying the personal multiplicity of the subjectivity [8] ensures overcoming the primary and broadly accepted view of the long-form narrative created in the Elizabethan era as a starting-point of the genre formation in England surpassing the architectonics of the romance formed in the continental Europe and, at the same time, incomplete and imperfect in comparison with the classical form of the novel established from the eighteenth to the nineteenth centuries.

Based upon the identification of the genetic models of the literature with its structural matrix corresponding to the classical concept of the subject renovating “the presumptions of metaphysics” (J. Derrida) this angle of the genre reflection has predetermined the contradictory historical and literary reputation of the English Renaissance novel.

Having laid the foundations of its discovery in the study by J. Jusserand realized the cultural-historical approach to the literature introduced by H. Taine, the application of the poetical criteria characteristic of other (former or later) genre historical modifications to the novel arisen in the age of W. Shakespeare resulted in its underestimation revealed in the diachronic representations of the genre formation in England performed by the positivistic literary criticism (E. Baker [2], W. Dawson [9], R. Church [10], A. Kettle [11], J. Knight [12]) and preserved in the attempts of their renovations undertaken on the sociological ground

(M. Schlauch, [13] D. M. Urnov [14]). In these areas of the genealogical thought the creative experiments given rise to the long-form narrative in England at the end of the sixteenth century appeared as the genre transformations coinciding in their aesthetic direction with the achievements of the English

novelists of the Enlightenment but linked in their poetics with the romance stereotypes.

Such an ambiguity of the position in the process of the genre formation prescribed to the Elizabethan novel was not overcome in the synchronic reconstructions of its genesis made in the field of structural (W. Davis [15]) and post-formalistic (P. Selzman [16]) fields of view of the genre modification in question. Aimed at thinking the connections of the long-form narrative emerged in the age of W. Shakespeare with the principles and markers of the Renaissance artistic consciousness these visions of the novel inspired by Elizabeth I didn't reveal the peculiarities of the aesthetic renovation of the traditional genre poetics embodied in it because of generalizing M. M. Bakhtin's concept of the novel dialogism [17] and Y. N. Tinyanov's idea of the genre self-alienation [18] marked by the incompleteness of the authors' definitions complicating the comprehension of the historical specifics of the romance/novel formation in their light.

A real break-through the underestimated historical and literary reputation of the Elizabethan novel was initiated by the scholars of Dnepropetrovsk National University started its study under the supervision of L. Y. Potyemkina in 1990th years. Having anticipated the renewal of the historicism as a method of literary criticism performed at the end of the twentieth — in the early twenty-first centuries in the sphere of historical poetics this initiative was realized in the series of investigations which revealed historical-poetological peculiarities of the long-form narrative appeared in Shakespeare's England in the course of examining its genre typology (L. P. Privalova) and its authors' variants (T. I. Vlasova, L. R. Nickiforova, H. N. Sklyarova, N. N. Torkut). All these lines of the scientific search applying to the English Renaissance Novel emphasized the connection of the Elizabethan genre innovations in question with the transformation of the poetical dominant from the style into the genre laying the foundations of the author's fulfillment in the movement of late-traditionalistic artistic consciousness from the superiority of literary canon to the priority of the individual creative activity. Strengthening on the historical-theoretical ground formed by the correlation between the genre genealogical models and its structural matrix realized in the course of the emerging methodological renovation of the literary criticism such a vision of the long-form narrative created in the age of W. Shakespeare contemplates the investigation of its genesis in the aspect of the Renaissance comprehension of two main ways of the traditional interaction of genre, style and author manifested in the categories of mimesis to demiurgia.

The English Renaissance novel was founded in the creative experiments performed John Lyly (1554–1606), Philip Sidney (1554–1586), Robert Greene (1560–1592), Thomas Lodge (1558–1625), Thomas Nashe (1567–1601) and Thomas Deloney (1543? — 1600?). Revealing the historical dichotomy of the genre established by the late traditionalistic poetological transformation of the romance resulted in the appearance of the novel [19, 97] their genre innovations real-

ize in its modification remote from the poetical characteristics of the romance and, at the same time, distant from the poetics of the novel. The creators of the long-form narrative ensuring the expansion of the genre to the British cultural areal completed a historic transformation of romance aesthetics by returning to the principles of the genre formation founded by the classical rhetoric. In such a resumption of the initial model of the romance genesis [20, 136] actualized in its love-adventured variant created by Heliodor at the end of antiquity they became involved into the process of establishing the literature of late traditionalism as «conscious poetic and rhetorical unity» (S. S. Averintsev) based on the approval of the variety of forms of literary creative activity.

The type of the interaction of rhetorical and poetical sources of the literature embodied in the creative works by the Elizabethan novelists differs from the way of intermingling the criteria of poetics and rhetoric characteristic of the continental creative experiments directing on the renewal of the romance narrative matrix (from M. Bojardo and L. Ariosto to M. Cervantes and anonymous authors of picaresque novel).

The writers of the Elizabethan England focusing on the rethinking of the rhetorical foundations in the course of creating the long-form narrative took into consideration the idea of imitation of the sample transforming to the competition with its author. Thus they realized the disposition of the cultural dialogue formed by the Renaissance artistic consciousness and inspired the coordination of Aristotle's and Horatio's models of literary creative activity.

But in contradistinction to the experience of the continental European novelists of this epoch, who changed the object of imitation from *natura naturata* to *natura naturans* in the process of the extension of the objective sphere of the literature moving genre thematic limits, the founders of the genre modification appeared in the age of W. Shakespeare preferred to transform the correlation of modality and topic in the genre-forming matrix founded by Horacio's poetics advancing in such a way to the neoplatonic reinterpretation of Aristotle's conception of poesy ensuring the substitution of mimesis by demiurgia on the base of mannerism.

This tendency manifests itself through the author's genre definitions applied to the species of the English Renaissance novel. The creators of this genre modification oriented on the narrative forms of rhetoric emphasized in their modal characteristics and non-limited in thematic parameters varying in their choice from the *history* and *discourse* to *treatise* and *pamphlet*.

These genre nominations formed the metatextual dimension of the Elizabethan novel predetermining its reception beyond the romance tradition transformed in different way in the authors' variants of the novel modification in question represented by such creative works as: "Euphues: the Anatomy of Wit" (1578) and "Euphues and his England" (1580) by J. Lyly, "The Countess of Pembroke's Arcadia Being the Original Version" (1580) and "The Countess of Pembroke's Arcadia" (1591–1592) by Ph. Sidney, "Pandosto, or the Triumph of Time" (1588) and "The Groath Worth of Witte, Bought with a

Million of Repentance" (1592) by R. Greene, "The Delectable History of Forbonius and Prisceria" (1582) and "A Margarite of America" (1596) by Th. Lodge, "The Unfortunate Traveler, or the History of Jack Wilton" (1594) by Th. Nash, "The Pleasant History of John Winghamcomb, In his younguer years called Jack of Newberry" (1597) and "The Pleasant History of Thomas of Reading" (1600) by Th. Deloney.

The ways of the genre formation paved by the novelists of Shakespeare's England differ in the poetical dominant interacting with the rhetorical narrative form.

Thus, J. Lyly, Th. Lodge in his creative debut and R. Greene in the work crowning his creative activity choose the Italian Renaissance *nouvella*, offering its different rhetorical counterparts: *pamphlet* and *treatise* ("Euphues: the Anatomy of Wit" and "Euphues and his England"); *history* ("The Delectable History of Forbonius and Prisceria"); *pamphlet* ("The Groath Worth of Witte, Bought with a Million of Repentance").

Ph. Sidney in both versions of his "Arcadia" performs the unique combination of the rhetorical treatise with the epic model and chivalry and pastoral matrix of the romance.

R. Greene in the mainstream of his creative activity represented, in particular, by "Pandosto, or the Triumph of Time" and Th. Lodge in "A Margarite of America" marking the final of his genre innovation combine the connection of history

and treatise formed on the ground of rhetoric with Heliodor's, chivalry and pastoral types of the romance.

Th. Nash creates the variant of the English Renaissance novel close to the continental genre modifications of the epoch changing the central image of the chivalry romance by the contrary type of hero emphasizing the appearance of the picaresque novel. But in contradistinction to the continental way of its formation extending the narrative model of the Italian Renaissance novella, the writers of the Elizabethan England uses the matrix of rhetorical speech. This aesthetical preference complicates the realization of the motive of the hero's initiation revealing the specifics of the author's transformation of the romance poetics.

The uniqueness of Th. Deloney's creative experiment is based upon the connection of pamphlet and treatise with hagiography and jest-biography directed to the estrangement of the romance poetics renovating the axiological basis of its aesthetics.

Realizing the concept of the author as the demiurge inspired by the correlation of neoplatonism and mannerism the Elizabethan novelists in the course of the correlation of Horatio's model of the literary activity with its matrix created by Aristotle change the idea of imitation/mimesis implying the comprehension of the world to the concept of demiurgia supposing its formation.

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To the question about the image of staff captain Ribnikov in the short story by A. I. Kouprin

Abstract: The «Incomprehensible» (as stated by V. V. Veresaev) Russian-Japanese War 1904–1905 made Russian authors search for new artistic devices to reveal the character and the meaning of the Russian-Japanese War, Russian soldier, and the image of the enemy. A. I. Kouprin, uses semantic codes inherent in the literary type of the «little man» to develop the image of a Japanese spy. By the success of the masquerade, the staff becomes a hostage of his role. Like all his literary prototypes, the genius of espionage ends up as a victim of the traditional conflict between the «little man» and the state.

Keywords: «little man», image of an enemy, Russian-Japanese War 1904–1905

The Russian-Japanese War, determined as «the most important mental event» by N. Y. Gryakalova [1, 29], is still not studied properly, even compared with World War I, which is characterized as «unknown» in Russian literary study. Modern researchers pay attention to a row of aspects of war 1904–1905. One of these «puzzles» is the image of the enemy.

To D. von der Oye Schimmelpenninck, the Russians think about East «in various ways — as an object of conquest, as a reminder of the Mongol invasion, and as an «incontestable part of their own genealogy» [2, 11].

This ambiguous Russian approach to the East could not but reflected on the complex perception of the image of the enemy. During the Russian-Japanese War 1904–1905 even privates did not see the Japanese as dehumanized rivals. Y. S. Senyavskaya explains it by the fact that «macacas», depicted on crude colored woodcuts, turned out to be representatives of «another civilization», equal to «noble acts» [3, 33].

We explain this approach to the enemy not only by the «nobility» of the rival, but also by the fact that the goals of the war itself were vague and that it was carried out not in Russia, but on a foreign territory. What is more, the east theme seen as an «incontestable part of their own genealogy» tempted the Russians to find something in the Japanese that would make them similar to the Russians. «The absolute majority of the Russians had a very vague idea of Manchuria and Korea as well as about which interests, material and cultural can be touched in these countries. Japan itself and the Japanese were thought about as absolutely unknown values, which could not awake any affection or dyspathy, while the most educated part of the Russian society looked at them with sympathy taking into account their fast transfer from a barbaric state to European civilization, which was often compared to **the lift-over in Russia, carried out by Peter the Great** (emphasis added — R. P.)», — as a columnist for «The Russian Idea» wrote [4, 181].

V. V. Veresaev shows the Japanese as «little people», that is to say children on the pages of his writings about the Russian-Japanese War: «The Japanese were sitting on the grass. They looked slim and small like boys with sunburned

faces» [5, 246]; «A group of short people were going away from the spring and up to a small wood (not enemies, people. — note by R. P.) clad in black jackets and little peak caps which **looked like children's...**» (emphasis added — R. P.) (in original the author uses Russian diminutive-hypocoristic suffices in description. — note by — R. P.) [5, 245].

The image of a child developed by classical Russian literature of the XIX century as a symbol of spiritual and physical purity, specifies the direction in perception of the Japanese which is very far from the image of «dehumanized» enemy.

The Japanese spy in the short story by A. I. Kouprin «Staff Captain Rybnikov» also exploits Russian literary stereotypes by intendedly playing the role of a «little man».

At the first meeting with the journalist, the author describes the main character as «a fussy, funny and awkward man» [6, 369]. At the moment of their verbal joust, Tshavinskiy sees Rybnikov as a «small, cornered and movingly miserable one» [6, 389]. The journalist spots how the staff captain beats his breast with a «funny pride». The landlady describes her tenant as «a quiet, poor, simple minded, temperate in eating and polite man», who «never drunk alcohol or smoked, hardly ever went out and never had people round» [6, 366]. Nastya sees him as a «small elderly officer», who looks like a «mikado» [6, 395]. Military officials, «neat staff officers» note his «sheepish smile» and «flattering voice», his «illness, obtuseness, and a complete absence of self-respect» [6, 368]. We see him as an «unhappy, cornered, and reduced to indigence wounded military man» [6, 368]; «he was helpless, timid and naive» [6, 367].

Looking at the «episodes of biography» of a «small man», S. V. Savinkov and A. A. Faustov give an example from V. Dal's dictionary «I am a subordinate, small, and dependent one» [Op. cit.: 7, 150]. This is one of the examples the author of the dictionary uses to characterize the verb «subordinate». It is important that in the Russian literary tradition «small man» is a dependent person not only because his or her restricted circumstances, but also in their professional activity. Often, this activity directly refers to state or

military service.

Mind Pushkin's Samson Virin — an old soldier, who had spent thirty years in «military expeditions». Rybnikov also has a lot in common with Maksim Maksimovich, a character in Lermontov's «A Hero of Our Time». Rybnikov's «saffron color face» his «dark yellow» tan corresponds with Maksim Maksimovich's «tanned face» [6, 379]. Both characters are in the same military rank and a direct attitude to «the Asians» (we think that in this case we can look at the context of the Russian — Japanese war, in the beginning of which the Japanese were referred to as «Asians» by the official press, who claimed to «know them well»).

As his literary prototypes, Rybnikov in his role of a «small man» uses a lot of established phrases such as clichés, hackneyed phrases, quotations of the public opinion, endless Russian proverbs and sayings, parasitic filler words and periphrases from the published writings about the Russian-Japanese war and newspaper articles.

Rybnikov's speech has a lot in common with Marmeladov's speech with its tendency to philosophizing. In Marmeladov's speech clichés neighbor to high-flown language. We see Ribnikov in his role of a lowlife captain, rude, «untidy», and «not very sober». Dostoevskiy's character is this in his real life. Marmeladov is a titular counsellor, like other «small people»: Makar Devushkin, Popritshin, Bashmachkin. This rank corresponds to the military rank of staff captain since 1884. A significant place in the staff captain's speech is given to the «drinking» or «swinish» theme, so typical of Marmeladov.

«Entomological» and «ornithological» codes often work as the «key codes» of a «small man» [7, 178]. The etymology of the main character's surname is connected to the image of «fish»: «Rybnikov's surname origins from a nickname Rybnik. It could be a nickname of a fish seller. In Pskovsky subdialects Rybnik ment “a fisherman”. Fish thought to be sacred in many cultures and traditions as a mediator between the Heaven and the Earth, as a “bird of the Earth”. Later it became a symbol of a deep inner life, hidden under the surface of things and a sign of a rising power of life [8]. Rybnikov characterizes himself as following: «a sheep mug, but a human soul» [6, 381]. Tshavinskiy pays attention not only to his animal appearance, but also to his «thin, bluish, somewhat monkeyish or goatish lips» [6, 374]. Before the visit to the bawdyhouse, the staff captain says «To go means to go the parrot said» [6, 389]. Reasoning about the Russians and the Japanese, he calls the last ones «macacas», «swines», accordingly all these epithets completely refer to him, too.

If ontological traits of an animal that is a potential victim prevail in Ribnikov, then his opponent, Tshavinskiy, who is seen as a «passionate hunter or a volunteer detective», «an big man» («a columnist for an important newspaper in Petersburg», «an aristocrat of the world of newspapers», meets the staff captain «in a big office») has entomological treats of a spider: «Tshavinskiy softly and lovingly, with some enveloping spider manner gropped one's attention. However, having sated himself with the person, he left him» [6, 378].

At the same time, the Japanese spy also is seen as a hunter, a hunter for information about Russian army. It is no coincidence that the journalist sees him as an «exotic» beast with eyes burning with hate, «wise, humanized, cultural and polite beast» [6, 381]. With a «soft, catlike movement», the hero jumps on the windowsill, trying to escape the chase. Describing the night that the main character spends with Nastya, the author refers to Rybnikov as a «he-man». The staff captain resembles «the real type of a hospital, military office or intendant rat. It's important, that the image of a rat is negative only in the Western mythology: «The Japanese consider rats smart, witty and industrious»; «rat is connected to the cult of Daikoku, one of the seven gods of happiness in Japan»; what is more, «in medieval Japan there were beliefs of wererats, nedzumi», which is to mean «ninja» [9].

However, in the short story by Kouprin the literary code remains more significant and familiar (!) for the officials, journalists, the landlady and other characters, than the «rat» code.

As well Rybnikov's literary prototypes, the staff captain uses the «self-defense rhetoric» in a very skillful manner [7, 186]. Very often, he uses this rhetoric when he visits government bodies: «Why on the Earth isn't he still getting the benefit?! Why isn't he still getting the daily and travelling allowance? And what about the allowance for the last two months?» [6, 368]. The literary code of a «small man» implies reader's sympathy and the feeling of social unfairness. Officials recognize this code, so they intendedly make advances, communicate with Rybnikov and, in spite of the disdain, try to help him: «It was nothing else than the human wish to comfort, inform and cheer up a miserable one, that is why they talked to him **more frankly** (note by — R. P.), then to the other people» [6, 368].

To A. A. Volkov, «Rybnikov's true inward nature appear in his gestures, movements, glances and mimics. The deeply hidden, secret, glimmering something in his wicked and sharp look comes from the Samurai “insides”. Every time, Rybnikov has to damp at once this giving him away manifestation of will and “aggravates” the manners of an army bourbon»; «her, he is «lamenting” the defeat of the Russian fleet, but the columnist sees the flames of implacable and unhuman hate in his red animal eyes» [10].

However, Tshavinsky, even calling staff captain's line «a caricature» of a Russian military man, nevertheless trusts his literary memory rather than his own vision and hearing. We consider this the reason why A. I. Kouprin chooses the profession of a journalist for the staff captain's opponent.

It must be said that visual problems in Russian literary characters are the keynote of the writings about the war 1904–1905. V. V. Veresaev, N. G. Garin, I. I. Mitropolskiy, L. Nodo, G. Erastov and other researchers point out that the opposition of blindness//ability to see, ignorance//knowledge perform as the identification codes of the Russian and the Japanese in the literary writings about the abovementioned historical event.

The motive of obstructivity of the **visual** identification of the Japanese spy by the Russians is brilliantly shown in the short story by A. Kouprin «Staff Captain Rybnikov».

Tshavinsky several times notices Rybnikov's faults, but he is not sure **he is not imagining things**. Meanwhile, the staff captain tries to show a wound, revealing silk underwear; makes several slips, for example, uses the word «manuscript» instead of «writing», confuses Chekhov's patronymic, demonstrates «extremely correct reading, but with the exaggerated pronunciation of every sound, which one can see in a person, showing off their knowledge of a foreign language» [6, 377]. As A. A. Volkov writes «The Japanese person... is not able to complete his character» [10]. However, we consider that the Japanese spy makes these «faults» intendedly to check if the Russians are able to unmask him, if they have enough knowledge for this and teases opponent.

Rybnikov gives himself away by his speech, stressing Russian origins of words, sayings and proverbs.

The journalist «attentively», «secretly watches» the «staff captain», «slits his yeys» (tries to focus his sight), «strains his eyes», «looks around», «glances», «quickly examines», «took closer look to every gesture and the staff captain's facial expression, but could not comprehend him.

Consistently, the journalist and the staff captain meet in a restaurant, where the light is not bright enough to see clearly: «The air was blue and thick with tobacco smoke» [6, 370]. The smoke resembles the condition of an unreal dream or a phantasmagoria (and this is where the comparison of the staff captain to an alien comes from). These motives of instability and unrealism of the events in the literary writings about the Russian-Japanese war are often used to describe the space of the battles and the home front, which is to say the territories, involved into the war.

Tshavinsky tries to unmask the staff captain not only in the room filled with smoke, but also at races, but in vain. «Tshavinsky was a little distracted by the game, so he couldn't watch the staff captain all the time» [6, 383]. While going back from Buff with Rybnikov, it is getting dark: «it was neither light, nor dark» [6, 387]. The journalist is trying to see the staff captain in «uncertain, sleepy light of the white night» [6, 389].

The staff captain's advantage and his weapon is his unusual ability to see things: «glanced» [10; p. 373], «sharp bright coffee little eyes» [6, 373].

Having failed to unmask the staff captain by **seeing** him, Tshavinskiy attempts to **call** the main character and **identify** him this way: «Once they would find it fun to call Ribnikov by the names of Japanese generals... It was Tshavinsky who started this rude and unceremonious game» [6, 389]. However, the staff captain stands this attempt to visualize the enemy. Nastya's effort to visualize him also fails: «— You know, for God's sake, you look like a Japanese. And you know who you look like? A mikado. We've got a portrait. What a pity, it's late, otherwise I'd **show you** (note by — R. P.)» [6, 393].

This Blind Tom game with antitypical meaning of an attempt by the blind (dead) to catch the one who is able to see

(alive) [11], is stipulated by the literature-centered mindset of the Russian intelligentsia.

«Where have I seen him? — flashed a restless thought. — He surprisingly resembles me someone. Who?» [6, 370]; «I could have seen him in a dream» — the journalist is afraid to make a mistake. «What if I have imposed this ridiculous and biased myself? What if I, an inquisitive examiner of hearts, has fooled myself by Gogol's captain Kopeikin? There are lots of such Mongolian saffron faces among the Orenburg cossacks» [6, 379].

For the journalist, the literary «Kopeikin» code appeared to be more realistic and true than Rybnikov's «rat» code.

Mind N. Gogol's novel, a dramatic story about captain Kopeikin that is dedicated to a disabled person — a hero of the Patriotic War. The main character of Kouprin's novel, a Japanese spy, puts up for show his limp and tells everybody about his “heroic” deeds. As well as Kopeikin he came to Saint Petersburg (here is where Kouprin's story's going). Kopeikin asks a monarch for help because due to brachiotomy and amputation of a leg he wasn't able to earn his bread and butter. Staff captain Rybnikov “appeared several times in the main headquarters, in the section of wounded, in the police stations, in the commandant's headquarters, in the directorate of Cossack troops and in the dozens of public offices and administrations... Everybody was aware of the fact the he served in the transportation corps, that he had suffered a head contusion outside Liaoyang and in the battle of Mukden he was wounded in the leg. Oh, damn! Why hasn't he got any benefit yet?

It's necessary to draw your attention to the fact that an epistolary style that is indirectly connected with a literary language plays a leading role in the life of the Japanese spy. Practically an introduction of the story and a beginning point of Rybnikov's “journey” around public offices, streets, railway stations and street cars was a “telegram from Irkutsk”. Epistolary style also serves as the reason of the unmasking of the spy: “Banzai” — the unique word that Nastya knows from Japanese papers [6, 397]. Rybnikov considers the functionaries of military departments he goes to “busy with important and incredibly responsible paper work” [6, 367]. In spite of the author's irony, these are the bureaucrats who authorize the provision and work of the Russian military men in the army and navy, and practically predict the future act of war.

Invariant of paper work is the work of journalists, who make reality from rumors writing their articles and reports. Some researchers think that Rybnikov came across the journalists by chance. However, as the author points out: “this intrusive, arrogant and cynical company was kind of a sensitive receiver of different city rumors and talks, which very often came earlier to a special office of “Petrograd Glory” that to the ministers' offices” [6, 375].

In accordance with it, the part of rumors could be true, that might be sent fast to Irkutsk.

Kouprin shows that literary characters can be even more real and alive than their prototypes. The journalist doesn't

believe his eyes and ears but believes a literary image. “And what if I am mistaken and this Rybnikov is the real hard drinker? Oh, damn! That’s impossible! And if it’s possible, gosh, I behave myself as a real fool!- is doubting Tshavinskiy [6, 385]. The staff captain, as if he could read the journalist’s thoughts, writes provocatively on the blackboard with a light, clear and incredibly delicate writing: “Though, you’re the 7th, Ivanov, you’re such a fool (emphasis added — R. P.)”. Here Kouprin uses an allusion to “The overcoat” (short story by N. Gogol), where the main character had a clerky skill.

At the same time Tshavinskiy seems to have forgotten that in the code of Kopeikin there is an inner bottom — a predatory code while the author remembers it well.

It’s not an occasion that a drunk officer from the café chantant and a killer Sanka the Butcher become secular “twins” of Rybnikov, who predict his destiny. Sanka the Butcher also pretends to be an alien, “different” (“Kornei Sapotov, kolpin bourgeois [6, 398]), “drunk”. Rybnikov asks officers to give him a cigarette, Sanka the Butcher “borrows” a cigarette” from Lionka.

Police spy Lionka, the idol of the bawdy house, is a Tshavinskiy’s twin, according to S. Tashlykov, he is like Tshavinskiy’s “other dyad — rude, physical” (once he caught Rybnikov. “he is disturbing a victim with a crazy animosity”) [12]. But Lionka is not only a twin of Tshavinskiy, he is a police spy that serves to the state as well as those “spotless officers” in the public offices, easily deceived by Rybnikov, who pretends to be a person of little mark. In contrast to the mentioned above, the police spy doesn’t confide the literary code, but his own eyesight, that is not clear and sober (before the arrest of Rybnikov he takes abricotine).

He “discerned” the staff captain without being sure (there were no proves, except Nastya’s evidence) that the captain was a Japanese spy (“he still had some doubt” [10; p.401], Lionka “being a good patriot “decides to arrest the captain.

A.I. Kouprin speaks ironically about the situation when in Russia in the period of war with Japan “real patriots” can be met only among trackers, prostitutes and never among Russian clerisy. ... Tshavinskiy admires a spy’s ability of transforming: “Forget how to think in Japanese, **forget his own name and identify himself with another personality** (emphasis added — R. P.)”, that is more than any valour [6, 381]. That’s why Tshavinskiy doesn’t mean to blow the whistle on him in case of unmasking the spy. It is well-known that the main conflict of literary works about a “person of little mark” consists in the conflict between “the person of little mark” and “the man of mark” (in this particular case with Lionka), who represents the state. And the result of this discord is the main character’s death.

Taking literary plots which are connected with an image of a “person of little mark”, A. I. Kouprin in a short story “Staff Captain Rybnikov” shows the leading role of literary stereotypes in the consciousness of Russian people that is the reason of their blindness towards the reality as they trust what they read more than what they see. The leading role of literary images causes not only the dehumanization of an image of the enemy, but quite the contrary, his glorification. It’s obvious that with such a seeing of an enemy image, the concept of “patriotism” isn’t made actual in the society of Russian clerisy. As a result a police spy and a prostitute are the ones who defend their country. The fact that Russian people follow literary clichés makes possible for a character the use of an image of a “person of little mark” for espionage. At the same time a literary role becomes kind of a trap for Rybnikov who firstly was keen on “fooling” Russian people and after that he could hardly get rid of that role. The conflict of a “person of little mark” role’s victim with the state machine, according to the laws of the genre, leads to the unmasking (symbolic and probably real death) of the staff captain.

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Section 11. Philosophy

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Ontology of duality

Abstract: Based on the concept of biner developed by the author in recent years, in this article he explores the notions of duad, duality and polarity. The results which were obtained in the given study can be used as a preliminary tool in the study of basic ontological and epistemological problems.

Keywords: biner, duad, duality, polarity.

Nothing in the world can exist without distinction. The first and the simplest but also fundamental kind of differences in this case is duality, or biner. It is in biner where complete identity of form and content takes place. The principle of biner underlies any ontology, epistemology, philosophy, mythology, and, in general, everything. Biner is the first manifestation of the Unity proceeding to the creative process. Biner is not identical to contradiction, since alongside with contradiction it contains a number of components which are rarely considered in the traditional concepts of contradiction (such as the integral androgynous, thesis, antithesis, neutralization, and harmony). The notion of contradiction primarily includes the signs of confrontation, while the unity indicates, first of all, the moment when harmony and identity appear. However, biner also includes both of these points; it is the synthesis of contradictions and harmony, struggle and cooperation. Therefore, the concept of biner is richer and more synthetic compared to the notion of contradiction or antinomy, although the identity between them is significant too.

Without going into the complex and detailed analysis of the structure and dynamics of biner, I will only note here that the most important manifestation of the binarity, duality and contradiction of being is the interaction between the poles of biner which normally takes the most diverse forms. In the course of its actions and manifestations biner penetrates and is projected on all levels of being; it reveals itself in endless forms and processes.

The simplest expressions of biner are such notions as duality, dyad (duad), duplicity, and polarity. These concepts suggest the need for distinction. The presence of differences allows us to make comparisons. In its turn comparison leads us to identifying the relationship and interaction. As a result of understanding the essence of a particular interaction reflection occurs.

The interaction between the moments of biner manifests itself in such forms as fighting, cooperation, hostil-

ity, harmony, dialogue, denial, and suffering. The transition and interaction between the poles of biner are realized in the form of vibration (that is, the mutual transfer of energy and information between them).

The duality of all elements of being necessarily leads to doubt and choice as well as to the problematic nature of any existential or life situation; however, this way it leads to freedom and responsibility. The lack of proper unity and harmony between the poles of biner leads to fighting, hatred and tragedy, inequality and disharmony.

Duality is also manifested in the form of various dualisms. Complex manifestations of binary relations include such epistemological phenomena as dilemma, alternative, aporia, paradox, and antinomy.

Biner is a manifestation of the simplest rhythm of Logos — the world Mind, or the law of all orderings. In old Greek, the etymological meaning of the word «Logos» is related to the verbs «to bind» and «to collect». Two other meaningful aspects of the word «Logos» are the word and proportion [1; 13]. In other words, Logos connects, collects, reveals and orders everything in some proportion. At the same time, to be able to implement all this, everything should be already discernible and manifested from the Unity and Chaos. Duality and duadness are the first manifestation of the future order and harmony. Logos begins its work precisely with biners. It also becomes one of the poles of the first biner: Absolute (Single) — Logos, — namely, its antithesis.

In many ways, the concepts of duality and duplicity are similar to the concept of biner, but, nevertheless, in their essence they are its aspects. Another reason for which it is worth starting the introduction to the theory of biner exactly with the concept of duality is the fact that the essence of any analysis is binomial rather than polynomial [3, 366]. In the long run, even the most sophisticated analysis to binary oppositions leads to various manifestations of the binary archetype.

Take, for example, the «Book of Changes», the system of Arcanas Tarot, the ratio of sefirot in the Kabbalah, Plutarch's dyadic logic of constructing paired biographies [7], the mechanism of duality in the works of art by many famous writers as well as the binary code used in computer programs. Therefore, we start the binary analysis with the study of the essence of binarity itself. However, this is just the very first, preliminary step in any study. A more complex form of analysis is the ternary analysis when the transfer to the conceptual level actually takes place.

A more complex task is to investigate the nature of speculative specificity [4,520]. Developing the concept of biner becomes another approach to clarifying the true nature of speculative specificity.

1. Duplicity (dyad, or duad). Duplicity is the first, special difference. It is already in opposition to the unit — the most primary formation, which, however, is unknowable and indefinable by itself. Duplicity is the principle of evil infinity and abstract indefinite divisibility. Everything consists of two parts, and, in its turn, each of these parts also consists of two parts [See 4, 430].

Duplicity is a symbol of division in unity. Duplicity is a kind of twofold formation, — that is, it is something that contains two unities in itself; however, these units are still not incorporated into a new unity; it means that they have not become yet a terner, trinity, or trinity concept. Duplicity is the principle of doubling, divisibility, growth, decrease and generally the process of formation [7]. We can say that duplicity has not yet become a biner, because there is still no interaction between the two elements of the dyad. Duplicity has two units which are not equal to each other. That is, it is the duplicity where difference appears at first.

Unity can manifest itself only through the dyad, or when creating differences in itself. Unity itself and its very idea are already an example of duality. However, the duality itself can be comprehended or understood only through the triad. True and more adequate understanding of the simple takes place with the help of using the more complex. Dyad itself is a thought about the indefinite [3,289]. Biner as such also has something vague. However, in this study we will not consider biner in terms of a more advanced concept — terner, although we will sometimes cover a number of aspects connected with the relationship between biner and terner.

Duplicity is the first breath and manifestation of the spirit. Duplicity is the number of love and the first condition of love. In the single devoid of duplicity, love is impossible. “Duplicity is the female number... The life of duplicity is the life of senses, but without mind control ...” [6, 782]. Another name of duplicity is dyad, or duad. Even Pythagoras believed that dyad is one of the most fundamental principles (along with monad). Monad is committed to serving and specific reason, that is, to God or to the mind. However, dyad aspires (applies) to the passive and material cause, — that is, to the visible world. This antithesis of monad and dyad has the basis of all dialectics [5, 93].

Those who are already familiar with theosophy, occultism and eastern teachings of Kabbalah will understand why dyad is Mûlaprakriti, cover Parabrahmam, and Shekinah-Shakti.

What is the difference between duplicity or dyad and biner? Symbolically, this can be expressed as follows. The symbol of biner (or, more precisely, one of the easiest of its characters) is a straight line. At the same time, the symbol of dyad is two straight lines that are unable to form a geometrical figure (as Pythagoras himself expressed dyad). Based on this symbol, it is possible to conclude that the dyad is a combination of two biners which are not able to interact with each other due to the lack of an element which would unify and synthesize them. S. L. Frank claims something similar to this: “... duplicity, which is rationally conceivable, — that is, logically and mathematically understood, assumes being of just two independently of each other, i. e. some kind of their equivalence” [9, 489]. This equivalence implies indifference or a slight difference.

2. Duality. Duality is an open, not closed, i. e., indefinite space (not only from the physical point of view). Duality is a combination of the active influencing principle and the principle of mirror, the perceiver. In other words, duality is already a more meaningful expression of biner, it is one of its rather adequate projections. The active, influencing principle is the thesis of biner, and the receptive principle is the antithesis of biner.

Duality is inherent in any form or in any level of consciousness. Duality is a manifestation of the binary nature of being. Every phenomenon stands “on the verge of double existence” [4, 223]. This manifestation has a universal and diverse nature. Duality is a basic law of life. The duality of life and of human consciousness is the real foundation of any thinking process and of any philosophy. As the first manifestation of plurality and difference, every duality reveals the way in this world. If there were no duality, there would be no way. However, if this duality is not defined and not clear to a human being, it becomes a source of various sufferings experienced by that man.

All spiritual torments of man take place because of different bifurcations of his/her spirit, soul and body. At the same time, in the case of overcoming uncertainty duality of his/her being a person converts the source of his/her sufferings into the source of creative harmony [10,62]. The development of relevant human consciousness is possible only through duality [10, 50].

3. Polarity. A more developed form of expression of binary archetype is polarity. It means not only the difference of elements but also their unbreakable connection with each other [3, 83]. Several philosophers have been engaged in comprehending polarity since ancient times (including Lao Tzu, Pythagoras, Schelling, Whitehead, Bachofen, Berdyaev, and A. Bam). In particular, F. Schelling believed that it is the polarity of properties and attributes that is a universal property of all existing things. “The law of polarity” was formulated by F. Schelling in his paper “About the World Soul” (1798).

As one of the most adequate manifestations of binarity polarity can be found everywhere. It includes the cosmic struggle of the sun and the earth, personalism and collectivism, the men's and women's [2, 60]. The relationship between movement and mass is the original polarity of classical mechanics. In a more complex form, the same polarity is expressed in the formula of Einstein in which movement is substituted with energy. The concept of a "universal man" introduced by F. M. Dostoevsky expresses the combination of all the polarities of the human nature [11, 125]. I. J. Bachofen believed that polarity is the basic feature of human beings.

In any polarity there are positive and negative poles. The positive pole is the thesis of corresponding biner, and the negative pole is its antithesis.

Thesis is the statement of affirmation and the negation of negation. Thus, by itself even thesis is already biner; it splits into two opposites, two poles, or two different ways of its manifestation. However, as biner the thesis is only available to such thinking which has reached a higher stage of development and ability to conducting a new level of synthesis.

The thesis is an active member of biner, it is the bearer of reality. This positive member of biner can not be comprehended directly. It is always given to us indirectly through its antithesis, or rather through the system of its antitheses (how many and what antitheses the given thesis produces depends not only on the qualities of the given biner but also on the cognitive characteristics of the researcher of that biner, i. e., on the set of epistemological biners which are already available to the given researcher).

Our empirical, earthly consciousness can comprehend theses only through the evolution of the antitheses revealing them. The thesis in the biner of the first kind (i. e., vertical, or hierarchical biner) is characterized by ontological immutability and is "only currently disclosed in the evolving antithesis" [10, 458].

Antithesis is a denial of approval and an approval of denial. Antithesis is a minus or negative member of any biner. V. Shmakov notes identity of the nature of evil and the nature of antithesis. As well as antithesis, evil has no self-sufficient value. However, if for some reason the antithesis of the given biner loses the contact with its thesis, if it stops getting creative impulses and the corresponding energy from it, it can turn into a vampire ghost devouring all available energy around him, though without any benefit for itself. A typical example of this at the everyday level is alcoholism and drug addiction. Alcoholics and drug addicts are those people who have lost the unity of their being, who has fixated on one side of their

lives and who devoted their lives only to antithesis. As a result, sooner or later the antithesis will swallow all their resources, time and energy, and there will come the complete breakdown of their personality, body and soul.

Antithesis is a passive member of the biner; it is a sort of detonation action of the plus members, or the thesis. The task of antithesis is to implement realization, actualize the content of the thesis, assist with the transformation of this content into the concrete speculative content as well as with the implementation of synthesis and the fusion of the abstract speculative with the concrete empirical.

The antithesis of any biner is different from its thesis because of the presence of the secondary binarity of the lowest order. V. Shmakov calls it "additional binarity". This means the following. The antithesis for actualizing the influences of its thesis falls into a biner at a lower hierarchical level by itself as compared to the thesis. Without having any distinction in itself, antithesis can neither express the content of the thesis nor perceive its energy and its impact. For example, in a biner mysticism is the mind; the mind is the antithesis and has a secondary binarity of the lowest order. However, that very mind is a biner too, as it splits into the mind (where it is already the thesis of a biner) and the reason (that is, the antithesis of the reason). In this connection it is necessary to take into account another important element which is the mind, a synthesis of reason and understanding; it is different from the mind as from its aspect. It means that, in spite of the fact that they have a significant, substantial resemblance with each other, as an integral the mind is not quite the same as the mind being the thesis,

In each concrete state of antithesis there is present its entelechy, but the content of this entelechy is not relevant from the point of view of this antithesis. Only passing through the chain of its states in conjunction with holding in itself all the essential points of the chain the final entelechy of the antithesis begins to appear. Any idea is disclosed in this consciousness in strict accordance with the perception and knowledge of its antithesis.

To sum up, it is necessary to note that, despite the fact that biner is the simplest kind of ontological and epistemological formation, nonetheless, it has a very complex and dynamic nature. In the study discussed, we reviewed with you the very first projections of biner in the world and in the human mind, namely, duplicity (dyad, or duad), duality, dyad and polarity. The analysis showed that all this is not as easy as it may seem at first when becoming superficially familiar with these concepts. In the next articles, we will continue our research in this area.

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To the problem of the genealogy of personalism

Abstract: The article focuses on origins of the personalistic philosophy and explores its ways of formation and national variants. It has been clarified that personalism as a philosophical movement took roots in Christianity having been inspired by the concept of person formed by this teaching.

Keywords: Christian teaching, personalism, subject, subjectivity, person, personality, individual, genealogy.

The recent history of philosophy is characterized by the search for such reasons of personal self-identification that will ensure overcoming its crisis, marking the end of the twentieth century. Provoked by the postmodern differentiation between person and subject based upon the refusal of metaphysical presumptions, the loss of identity felt and realized against the philosophical background of postmodernism predicts its historical and cultural outcome. Revealing in the early twenty-first century as a motive in renovating the criteria of the personality, the revision of the rationalistic subjective principle performed by post-non-classical philosophy predetermines the perspectives of humanitarian reflection, aimed at reviewing the concepts of the subjectivity connecting the authentic kernel of a unique self with the rationality.

It is all-known, that a departure from the classical type of philosophizing, significant for the transformations of worldview occurred in the last century, was initiated by the new perception of the subject which had developed throughout the nineteenth century as a reaction to perceived depersonalizing elements in seventeenth century and Enlightenment rationalism, Kantian epistemology of transcendental idealism and Hegelian absolute idealism. Such a revision of the rationalistic philosophical branches forming the basis of post-traditionalistic consciousness resulted in realizing the irreducibility of the subjective formation only to the laying and revealing of cognitive foundations equalized in the famous formula by R. Descartes “*cogito ergo sum*” (in spite of its rationalistic nature discovered, according to the author’s confession, under the mystical circumstances!).

The change of paradigmatic precepts of philosophical thought which led to the formation of non-classical philosophy, occurred in the course of identifying the aspects of the subject, exceeding his cognitive self-identity, substantiated in the dialectic of Hegel. Such an extension of the subjective limits revealed in the different areas of philosophical reflection,

including: the neo-Kantian advancement to the realization of the being as a dialogue initiated by the opposing “explanation” to “understanding” (W. Dilthey) and the nomothetic method to the ideographic approach (W. Windelband); the meta-description of phenomenological reduction actualizing the category of the inter-subjectivity (E. Husserl); the comprehension of irrational vital sources forming the basis of “philosophy of life” (H. Bergson,

F. Nietzsche); the perception of human existence reception as an experience, fundamental for existentialism (S. Kierkegaard, K. — Th. Jaspers, J. — P. Sartre).

In all these fields of vision the subjectivity uncovered his individual, personal character, which could not be exhausted by the rationalistic generalizations of the subject’s essence. Determining the formation of modernist worldview, such a turn of philosophical thought predicted its “epistemological uncertainty” delimiting “modernity” of “history”. In the course of their demarcation the philosophical discourse took aim at the disclosure of the personality in the diversity of his individual existential manifestations. This intention was realized on the ground of the personalistic philosophy, anticipated by the ideas of Russian philosophers of the second half of XIX — early XX centuries and established in two variants — French and American. However, having formed the vision of the subjectivity, which inspired the renovation of philosophical consciousness in the last century, personalism was denied in its fundamental principles in the process of the formation of post-modernism, approving post-non-classical way of philosophizing. Having been inspired by the personalistic exposure of the limits of rational knowledge, the postmodern deconstruction of classical philosophical concepts destroyed the axiological dimension of the personality repudiating the whole worldview as the basis of subjective unity. But the dynamics of post-non-classical philosophical reflection which reveals in moving from the deconstruction

(J. Derrida) and the genealogy of knowledge (M. Foucault) to the philosophy of communication (J. Habermas) and the ethical phenomenology (E. Levinas) predetermines the return to the problem of personalism at the turn of the twentieth — the twenty-first century, emphasizing the necessity of rethinking the origins of the personalistic philosophy.

Personalism is considered to be an influential philosophical trend of the twentieth century based upon the contributions of a wide range of European and American thinkers including such figures as Borden Parker Bowne (1847–1910), Josiah Royce (1855–1916), George H. Howison (1834–1916) Edgar Sheffield Brightman (1884–1953) Ralph T. Flewelling (1871–1960), William Ernest Hocking (1873–1966), Emmanuel Mounier (1905–1950), Jean Lacroix (1900–1986), Sergius Nikolaevich Bulgakov (1871–1944), Nikolay Aleksandrovich Berdyaev (1874–1948), Lev Isaakovich Shestov (1866–1938), Nikolay Onufriyevich Lossky (1870–1965) and others. And it should be marked that the classical version of the personalistic philosophy is associated with the French personalism originated by two above-mentioned philosophers: Emmanuel Mounier and Jean Lacroix. In particular Mounier's views "affected the decisions of the Second Vatican Council" [1] (here and further the translation is mine — V.P.)

But using interrogative pattern actualized by the Venerable Nestor the Chronicler, the founder of the national history and asking: "ѡкуду єсть пошла [2, 24] ("what is the origin of...") the personalistic philosophy?" —, we reveal the connection between personalism and early Christianity predicated an express religious character of the philosophical movement in question. It is all-known that the Church-Slavonic expression realizing the author's version of the question of sources and roots has been accepted by the humanitarian study of our country as a prime marker of the starting point in the investigations realizing historical methods (The comprehension of this meta-narrative model implies the perception of the original text of the Primary Chronicle: "Се повѣсти времяныхъ¹ лѣтъ. ѡкуду єсть пошла рускаѣ землѣ² кто въ киевъ нача первѣе³ княжитъ⁴ и ѡкуду рускаѣ землѣ стала єсть" [2, 24]). Owing to this reference, personalism possesses a certain power of survival alien to scholasticism.

But it is impossible to identify the philosophy of personalism with Christian teaching and, moreover, with any religious confession. As Mounier says, "it is possible to be both Kantian and personalist, socialist and personalist, Christian and a personalist" [3, 56]. Atheistic thinkers made their contribution to the formation of personalism, but such cases were extremely rare.

Thus a philosophical school or system can be hardly accepted as the appropriate criterion of the definition of personalistic reflection, "this is rather a frame of mind, a life position" [4]. Moreover, many creative works touching personalistic subject demonstrate non-philosophical language. "Personalism is just a reassessment of values, showing the fact that the human person is the basis of all searches, all philosophical and

social aspirations" [4]. The personalistic philosophy is more expressive than conceptual.

The modern personalism can be regarded as one more attempt of pouring the new wine in the old bellows of philosophy, as an attempt of appealing to authentic spiritual values. At least this intention was realized by the founder of the classical personalism Emmanuel Mounier. According to his own words, his philosophy "is not burdened with deep-rooted habits and does not believe in formulations completing the definite status of thinking and life... It exposes the great uncovered images of the world and rips the guilt off the soul, unmasking affected politeness, indulgence and outspoken commonplace. This is its force." [3, 46].

Mounier's philosophy is full of ebullient energy and noble impulse of a young man: "we see that the young and lively world gasps in secular garbs. Who will assure a clearance of the dead forms which oppress even eternal values at every moment of development, hinder them to keep their identity, imprison them into the ephemera if not the people trying to carry the youth of the spirit?" [3, 76].

The theistic tendency of personalism is reflected in the very title of the organ of the French philosophers, the magazine is called "Esprit" ("Spirit"). "The Spirit, this old precious obstacle, is so comfortable, so familiar... The primacy of the spiritual! No matter what noise shouts and howls of the crash would make: this is at last one of those serene words which carry the peace." [3, 77]. A source of inspiration and healing of human nature he sees in Christ: "The lacerated body of the proletariat becomes like the crucified body of Christ, surrounded by hypocrites." [3, 78]. The philosophy non-converted to the Primary Source of wisdom, can't actually give the peace. One of Mounier's compatriots Blaise Pascal lived through an unusual night "in the commemoration of which he kept to his death a note on the parchment stitched, sewn into the lining of his coat. That note began with a designation of the date and contained a number of fragmentary and metaphorical expressions: "Fire. God of Abraham, God of Isaac, God of Jacob, not of the philosophers and scholars. Certainty. Certainty. Feeling. Joy. Peace." [5; 6]. Pascal faithfully kept the remembrance of his mysterious experience until his death.

Personalists draw attention to the integrity of the human personality, regard a man as the image and likeness of God, indicate the ontological essence of the personality. The origins of personality are rooted not in himself, but in the infinite source — God. Appealing to the Christian doctrine, they emphasize that a man as a person is the primary creative reality and higher spiritual value, and the world is the manifestation of the creative activity of God as the Supreme Person. The Christian God is a personal God. «Personal relations with the impersonal theistic Absolute are impossible.» [1]. The dogmata of Christianity are personalistic, the deeds of the Creator concerning a man are personalistic, everything has been done «for our sake and for our salvation.» The personalistic sense of Christianity rooted in the doctrines of the Holy Trinity — Father, Son and Holy Spirit, the creation of man in

the image and likeness of God, His incarnation. «God enters into unique personal relations with each person. These relations reach their height in the possibility of living communion with God and even union with Him.» [4].

Thus, personalism is a fundamental principle of Christian monotheism and a direction of the same name in Christian philosophy. But «it is exactly the Christian doctrine that is consistently personalistic to the end. Mounier constantly emphasizes that he does not found a new philosophical school, but simply repeats the old, hackneyed truth that a person needs to return to his roots — to God, that man must return through God to himself, and thus to know himself and find the peace in his soul and in the society.» [4] He admits that the purely speculative development of the philosophy is not able to compensate for the reducing of the spiritual life. It requires other means. «The attempts to find God in the way of abstract conceptual cognition, that had been made by the theologians and philosophers, limited personal and existential human contact with God.» [6]. The main task of the philosophy of Mounier, Lacroix and other personalists is expressed in the reorientation of the man, his returning to the primary Christian origins.

The personality in personalism is characterized, first of all, by the freedom of moral choice. The freedom is a seal of the Creator on His creation, a God-given gift for the spiritual moral perfection. God honored the man by granting him the freedom through which the person realizes himself. But the man is truly free when he is in the truth — «Then you will know the truth and the truth will set you free.» (John 8:32).

The man is a free being, and the use of freedom, depending on the choice can become the cause of his happiness as well as the cause of his suffering. Without the truth the great gift of freedom brings great torments — «nothing has ever been for man and human society more unbearable than the freedom!» [7, 277]. «There is nothing more seductive for the man than the freedom of his conscience, but there is nothing more painful.» [7, 277]. Without the truth, people «can never be free, because they are weak, vicious, worthless and rioters.» [7, 277]. Having wasted the freedom and satiated their passions and vices enough, they will find themselves bound hand and foot, and their «freedom, free spirit and science will lead them in such a jungle and put before such miracles and insoluble mysteries, that some of them, who are unruly and ferocious, destroy themselves, some other who are rebels, but weak, destroy each other, and the rest of them, feeble and miserable, will crawl to our feet and cry out to us: «Yes, you were right, you alone possessed the secret of it, and we get back to you, save us from ourselves.» [7, 278].

Hawing drawn attention to the philosophical reflection of many predecessors personalists gave their own thought a philosophical appearance, enlisting a reliable aid of the supernatural Revelation contained in Christianity. As a philosophical school, personalism laid its foundations under the significant influence of Socrates, Pascal and Leibniz. In the

field of philosophy personalists made more subtle and clear the concepts of individual and person. The man as a part of the genus, as a part of the society is an individual.

According to the personalistic definitions, «the individual is a biological characteristic of the man with all his individual biological differences: the colour of eyes, hair, the number of moles and so on» [4], and the person «is a unique unit, not as a material, biological, but as a free unit, first of all, creating and acting freely.» [4]. In contrast to the individual the person is not static, he is alive and dynamic, being in formation, transcendence, constant self-creation. Responding to the call of God, the person goes beyond his own self. Becoming the person is the transformation, the implementation of the image and likeness of God. To be the person means to go to God. This very intention paves the way for the existence of true relations between persons.

Personalists also express their disagreement with idealism. Despite the fact that the idealists formally close to the ideas of Christianity and even sympathize with this teaching, they not only lead to personal God, but do not point to Him. The search for the truth in philosophy without the experience of communion with God condemns the philosopher to roving, incompleteness, doubts. The American personalist William Ernest Hocking in his work «The Meaning of God in Human Experience» (1912) notes that «the philosophy cannot lead to religion, because it can not lead us to the knowledge of God, and above all ... the philosophy will never be able to create a God who is worshiped.» [8, 97]. The essence of pagan and godless philosophy was discovered in the Apostle's Prevention «Beware lest anyone cheat you through philosophy and empty deceit, according to the tradition of men, according to the basic principles of the world, and not according to Christ». (Col., 2:8–20)

Becoming a person is only possible in the ethical dimension, the only communion with God makes a man the true personality. The creative power of the person is Love. «God is love» (1John 4:16) «God is spirit» (John 4:24) «Love is the ontological essence of personality. Love that person answers the call is not a passive feeling it is the source of all human activities.» [1].

As to the question of social problems, it is solved in different ways in the American and French personalism. The first area remains in the frames of the detection of the crisis of modern society and human being setting the hopes on the viability of Western culture and substituting the social issues by the task of the individual self-improvement. The French personalism, focusing attention on the social doctrine (Mounier), preaches the ideal of medieval commune as the antipode of urban civilization. The French personalism, painted pessimistic, is characterized by an anti-capitalist orientation. Mounier wrote about the general crisis of capitalism, leading to his death; called for social renewal, to the «personalistic and communal revolution» [3, 113], differed by him from the socialist revolution, leading to collectivism. This revolution, in his opinion, should be both spiritual and economic, to cre-

ate conditions for personal development and overcoming the conflict in society. It is conceived as a result of the spread of personalistic doctrine among the people.

In whole as a philosophical movement formed in the connection with Christianity personalism has become close enough to a large number of Christians, especially in the West.

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Why did Kolmogorov use a dependent requirement to probabilities?

Abstract: An explanation due to Shafer and Vovk is studied for Kolmogorov's using the requirement of proximity of theoretical probability to frequencies, which can be derived on the basis of Bernoulli's theorem and Cournot's principle. To some extent, this explanation is subjective. Some new philosophical and formal arguments are proposed in favor of rationality of this explanation.

Keywords: probability, independence, Cournot's principle, Bernoulli's theorem, frequency interpretation.

In 1933 A. Kolmogorov published a book, where an axiomatic theory of probability was proposed, which was eventually accepted by the mathematical community [1]. In 1936 the book was published in Russian [2]. This small-volume monograph was not purely mathematical; it also examined some issues related to the methodology of application of probability theory. In particular, Kolmogorov formulated two statements, describing the properties of probabilities, for the events being studied in the applications of probability theory. These requirements by Kolmogorov are the following:

«A. One can be pretty much sure that if a set of conditions S is repeated a large number of times n , and m denotes the number of cases in which the event A occurred, then the ratio m/n will differ little from $P(A)$.

B. If $P(A)$ is very small, then one can be pretty much sure that for a single realization of the conditions S the event A will not take place» [2, 13].

In the literature, the condition B is known as the principle of A. Cournot [3]. In the case of several requirements there naturally arises the question of their compatibility. According to G. Shafer and V. Vovk, it was noted already by Kolmogorov's contemporaries, in particular, by E. Borel, P. Levy and others

that condition A is derivable from condition B and Bernoulli's theorem. Even though Kolmogorov formulated the requirements to probabilities informally, it is naturally assumed in the statement about derivability of one condition from the other that these conditions are given in a formal way. It should be noted that condition A is the conclusion of Bernoulli's theorem. The reason for using condition B is that the conclusion of Bernoulli's theorem is true on any typical sample. The fact that the conditions A and B turn out to be dependent gives raise to several questions. Why did Kolmogorov finally decide to use dependent requirements for probabilities? Why didn't this fact appear in the center of attention of mathematicians long ago and was not thoroughly studied?

In two interesting papers Shafer and Vovk proposed several explanations of the linkedness of Kolmogorov's requirements [4-5]. The strongest explanation is based on a special significance for Kolmogorov of requirement A, since it has a frequency nature, and Kolmogorov noted that in the application of probability theory he followed, in general, R. von Mises, the founder of the frequency interpretation. This explanation is plausible, but it is based on Kolmogorov's preferences and, therefore, has a somewhat subjective character.

The purpose of the work is to substantiate the assumption that the appeal to the frequency interpretation to demonstrate a special role of assertion A can be justified and has a completely objective character. The proposed demonstration of the significance of statement A in the frequency interpretation is based on the arguments of both methodological and computational nature.

In this paper a formal argument is based on the frequency interpretation of probability theory, since it is adequate for the purposes of the paper for several reasons. Firstly, Kolmogorov pointed out to the adequacy of the frequency interpretation of probability theory in the context of applications. Secondly, the mathematicians, actively engaged in the applications, highly appreciate the role of von Mises' concept in the practice of scientific research. For example, V. Tutubalin writes: "It is now believed that von Mises' approach describes the properties of real phenomena, to which the mathematical theory of probability is applicable" [6, 14]. And then he continues: "at the

Methodological analysis of statement A

From the methodological positions, in the framework of frequency interpretation, statement A by itself, regardless of Bernoulli's theorem, has a well-founded, natural-science character. There exist two approaches to the correct verification of statement A. In the first approach, the empirical evaluation of the theoretical probability based on stable frequency

Methodological analysis of Cournot's principle

A critical analysis of Cournot's principle is offered. Firstly, a characteristic feature of low-probability events is that they occur rarely, but they can occur as a result of any test, including the very first experiment. In a sense, this is not consistent with the principle of Cournot, prohibiting realization of a low-probability event in a single test. Secondly, realization of low-probability events is a manifestation of chance. Cournot's principle prohibits realization of low-probability events, and thereby limits the manifestation of chance, though in science the realizations of extremely improbable events are known. Thirdly, Cournot's principle is in the foundations of statistical hypothesis testing. According to Cournot's principle, if an

Methodological analysis of J. Bernoulli's theorem

Bernoulli's theorem. There were conducted n independent trials of event A, and this event occurred in m experiments. It is known that the theoretical probability of event A occurring in each experiment is equal to $p(A)$, m/n is the frequency of the event A, ε is the calculation accuracy. Then, for the infinite number of experiments, the following equality holds:

$$\lim_{n \rightarrow \infty} P\left(\left|\frac{m}{n} - p(A)\right| < \varepsilon\right) = 1 \quad (1)$$

Bernoulli's theorem has played an outstanding role in the development of probability theory as a theoretical science and its development. However, its epistemological signifi-

Frequency interpretation of Bernoulli's theorem

The frequency interpretation of the theorem is modeled on the basis of the following experiment. The experiment consists of tossing a regular coin and is considered successful if the head

same time, Kolmogorov's approach creates a very convenient scheme, on the basis of which there is developed a mathematical theory, which is formally independent from any application" [ibid].

The best known adaptation of von Mises' theory for applied theories was carried out by Yu. Alimov [7]. Alimov's approach is not about a new mathematics, but about a specific relationship between the world of experience with mathematics. A fundamental problem of applied statistics is to obtain the stable frequency estimates of a studied random variable. The role of mathematics reduces to determining stable averaged characteristics of another random variable, if the operator connecting these variables is known. In this article, following the works of von Mises, Alimov and Tutubalin, we assume that all theoretical probabilities are unknown and determined on the basis of the frequency estimates. In the beginning we give a methodological analysis of Kolmogorov's requirements and Bernoulli's theorem.

characteristics and the qualitative assessment of verification of requirement A are assumed. The second approach involves the empirical determination of the theoretical probability and the use of frequency interpretation of Bernoulli's theorem to verify the statement.

unlikely event occurs under the assumption of the hypothesis being correct, then the hypothesis is rejected. It is believed that the correct hypotheses are rarely rejected on the basis of this principle; however, there are data structures where the application of Cournot's principle in the case of unlikely event realization leads to systematic errors. Here is a famous example demonstrating the shortcomings of the methodology of hypotheses testing, which uses the principle of Cournot. If John is an American, then it is unlikely that he is a member of the US Congress. However, John is a member of the US Congress, so the correct hypothesis of his being an American is not confirmed [8, 32-33].

chance is overestimated. Firstly, in the context of empirical interpretation, theoretical quantities are never known, while in Bernoulli's theorem a theoretical quantity, the probability of success, is known. Secondly, in the framework of empirical interpretation, one can talk about the external probability P in the theorem only in the case of existence of stable estimates for the theoretical probability $p(A)$. Furthermore, as will be shown later, verification of requirement A on the basis of definition of the external probability P requires much more calculations than on the basis of stable estimates for the probability $p(A)$.

results. One series of experiments consists of n tosses, k is the planned number of series of experiments; thus one needs to carry out $k \times n$ experiments altogether. Note that in each series of

tests one frequency characteristic of the event A is determined. Obviously, k frequencies will be obtained by carrying out k series of experiments. In the proposed experiment, the theoretical probability $p(A)$ is determined by the frequency characteristics of the event under study; namely, if the observed frequencies are really close to each other, i. e. fall within an interval of the length which is less than or equal to the observation accuracy ε , then we will take any of the frequencies as the probability. If the frequency characteristics are highly variable, then no good estimation of the frequency exists.

In the case when, under a large number of trials, the overwhelming majority of the frequency estimates belong to a distinguished interval of the length less than ε , then, by virtue of this, verification is carried out of statement A without using the conclusion of Bernoulli's theorem. Then, the evaluation of the external probability P does not have any particular significance, since it is determined on the basis of the obtained estimate of the probability $p(A)$ and requires additional calculations. However, in general, the estimation of the external probability matters. There are different approaches for determining the sought-for probability.

In the standard theory of probability the derivation of Bernoulli's theorem on the basis of the local theorem of A. Moivre – P. Laplace presupposes a large number of experiments. Even more experiments are necessary for obtaining this theorem on the basis of P. Chebyshev's inequality. In order not to depend on these requirements, we will calculate the external probability in Bernoulli's theorem on the basis of the frequency approach.

In the purely frequency-based experiment, the external probability P in Bernoulli's theorem is defined by analogy with the probability $p(A)$ and on its basis. Now let us carry out an analysis of the required number of tests to evaluate the external probability P . The external probability is calculated on the basis of the frequencies w , with which the following inequality holds:

$$\left| \frac{m}{n} - p(A) \right| < \varepsilon \quad (2)$$

Note that, although finding the frequency characteristics w for the event, defined by expression (2), is more difficult than determining the frequency of the event A , the determination of these frequencies w within Bernoulli's theorem presupposes conducting the same experiment, on the basis of which the frequencies of the event A are determined. Then, according to formula (2), the frequencies w will be calculated based on the frequencies of occurrence of the event A and the already known estimate of probability of the event A . Suppose that the i -th series of n observations has been held and a frequency m_i/n of the event A has been found, then, knowing $p(A)$ and ε , verification is carried out of fulfilment of the inequality (2). Previously, carrying out each series of n experiments provided obtaining the frequency of the event A , now

the same series of experiments leads only to getting a singular estimate, defining a single satisfiability or non-satisfiability of the second inequality. If we would like to determine the frequency characteristics w with the same precision as the frequency of the event A was determined, i. e., on the basis of n evidences, then it is necessary to get each frequency w also on the basis n singular characteristics describing the satisfiability of inequality (2). Therefore, in order to obtain n evidences determining the satisfiability of (2), it is necessary to conduct n series of experiments, where each series consists of n tosses of a coin; thus, to obtain one frequency characteristic w , it is necessary to carry out n^2 experiments. Since the probability $p(A)$ was determined on the basis of k frequency characteristics m_i/n , $i=1, k$, then, to determine the probability of inequality (2) being satisfied also on the basis of k frequency characteristics, $k \times n^2$ experiments are assumed to be conducted. And for each new estimate of probabilities based on the proposed experiment, n times more trials are required.

However, in reality, to obtain the frequency of a more complex event defined by the expression (2), it is necessary that the corresponding series of experiments consisted of N observations, where $N \gg n$, and also one will have to conduct a lot more series of observations K , where $K \gg k$. Here, the expression $X \gg Y$ means that X is much more than Y . As a result, instead of $n \times k$ observations to determine the probability $p(A)$, it will be necessary to carry out $N \times K$ observations in order to obtain the probability P , where $N \times K \gg k \times n^2$.

Thus, a rational explanation is proposed for Kolmogorov's choice of the dependent condition A . Firstly, within the frequency interpretation, requirement A , as an independent condition, turns out to be correct in comparison with Cournot's principle and Bernoulli's theorem, the requirement being the conclusion of the latter. Secondly, within the framework of the proposed computational experiment, the theoretical probability of success, used in statement A , is determined on the basis of stable frequency estimates for this probability; whereas, verification of statement A is carried out qualitatively, using the length of the interval for the frequency estimates of theoretical probability. In the case of verification of statement A on the basis of the frequency interpretation of the external probability in Bernoulli's theorem, there are needed much more trials in comparison with the qualitative approach to verification of statement A .

In our opinion, the lack of explanations of the linkedness of Kolmogorov's requirements prior to the publications by Shafer and Vovk is due to two reasons. Firstly, this is connected to the unpopularity of Kolmogorov's conditions in modern literature, so we do not know any books or monographs, where both requirements of Kolmogorov are presented, with the exception of the well-known textbook of H. Cramer [9]. Secondly, it seems that these requirements are perceived informally.

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Lev Shestov and Étienne Gilson: a dialogue against the background of the middle ages

Abstract: The article is devoted to analysis of the invisible dialogue between the two greatest thinkers of the twentieth century — Lev Shestov and Etienne Gilson. This is a conversation on the topic of the middle Ages: its problems and its features.

Keywords: Shestov, Gilson, neo-Thomism, faith, truth.

Lev Shestov's interest in the medieval philosophy was determined by the fact that the major themes of his creativity were closely associated with problems of medieval philosophical thought. In this context, it is necessary to mention first of all the issues of cognition, the relationship between faith and reason, salvation, the problem of good and evil, etc. Lev Shestov elaborated his final understanding of the medieval thought after the acquaintance with the works of Adolf von Harnack and Étienne Gilson. And if one considers the issue of synthesis of Greek wisdom and Christianity, it does not matter for Shestov how it happens: whether there is the process of Hellenization of Christianity (Harnack), or Christianization of Hellenism (Gilson). One cannot distinguish any comprehensive and objective study of the medieval philosophy performed by Shestov. He never set up such problems. In the works of thinkers of one or another era, Shestov sought answers to his deepest questions, and saw the themes of consideration in which he was interested himself.

It is important that St. Anselm's "credo ut intelligam" is not acceptable for Shestov. After all, this statement manifests that faith and reason cannot contradict each other; that reason leads to realization of the necessity of faith. By contrast, Shestov indicates that we certainly can realize something, but understanding will not add faith as such. Faith, for Shestov, is an insight which cannot be prepared or planned [4. p. 39–40].

And if the neo-Thomist position does not try to delimit the competence of faith and reason, seeking their complementarity, then Shestov sharply distinguishes them, and even opposes faith to reason. And if one considers the debate of Étienne Gilson and Lev Shestov in the context of problems of the Russian philosophy, Gilson's views are quite similar to the positions of V. Solovyov and S. Trubetsky [1. p.136].

The undisguised truth does not rely on anything, it does not prove anything, it is not justified to anyone; and yet in our mind it becomes a justified, proven and self-evident truth [5. p. 214].

Shestov interprets "The Spirit of Medieval Philosophy" and asserts that its central idea is as follows: the more true philosophy becomes a philosophy, the more it becomes Christian.

Shestov is impressed by Gilson's objectivity in issues which are key for him, namely, in the question which the French thinker raises: is the Christian philosophy possible without the existence of Greek philosophy [5.p. 217]. Gilson supports Gilson in terms of the idea that not only the Middle Ages, but also modern people have inherited the basic philosophical problems, rational principles and all the techniques of our thinking from the Greeks [5. p. 220–221].

Shestov, nevertheless, is a thinker of one idea, and in Gilson's works he focuses on those issues that have always

been interesting for him: the themes of tasting the fruit from the tree of good and evil; Tertullian's opposition of Athens and Jerusalem. For that matter, Gilson does not believe that such protests could and should restrain the medieval philosophy in its aspiration to transform the truth of revelation into the truth of rational knowledge. Gilson believes that neither the prophet Isaiah, nor Paul can be a support for those who dispute the possibility of rational Judeo-Christian philosophy; and the apostle Paul saw them as only the way to salvation, and not to cognition. However, Shestov disagrees with him on this matter. He believes that it is not only an objection to Tertullian's opposition of Athens and Jerusalem, but rather its interpretation. Shestov summarizes that what is wisdom for Athens is madness for Jerusalem [5. p. 229]. Here he sees the famous "credo guisa absurdum".

Shestov does not agree with Gilson's statement that the Greek philosophers were unfamiliar with monotheism. The Russian thinker draws attention to the fact that the Greek thought from the very beginning of its existence struggled to find a single principle in the universe. He asserts: "If it could be proven as twice two makes four that the Greek philosophers were monotheists, this would not mean that they anticipated Biblical revelation" [5. p. 260]. In one of his letters to Lazarev (August 23, 1934) Shestov summarizes Gilson's ideas which he does not share. He cannot accept the fact that according to Gilson, scholastic philosophy was Biblical. However, it is also undeniable for him that the Fathers of the Church displayed great attempts to overcome what the Greeks called "knowledge" [1. p. 129].

The one God which we discovered in the universe has as much to do with the God of the Bible as a barking dog with the Canis Major. Reason perceives the single principle; it needs to find someone who, as Blaise Pascal wrote regarding Descartes, will be the first to push everything going on: the reason has to understand.

But faith — again, of course, the faith of the Holy Scriptures — is not concerned with understanding or evidence. It needs something else, something that excludes every "understanding" and all the "evidence". Shestov constantly draws attention to the fact that Gilson declares "la bangeroute de la sagesse greque", and in the unity with the apostolic "what is not of faith is sin" (Romans 14.23) — this is actually already a rebuke and a stern warning. The Greeks await rescue from their knowledge-based wisdom, but they will find death, while the salvation is in faith, and only in faith [4. p. 264].

Shestov is convinced that medieval philosophy essentially had to abandon the idea of the necessity of bringing the idea about the created truth into the world. After all, it can be assumed that the world was created by God. But the truths are not created; they exist without Him, as did before him and will do after all. For Shestov, Gilson's thesis of "radical optimism" is very noticeable in this book, when the cognition metaphysics of Genesis refuses to see the reality which cannot be denied in the notion of "this fact". It raises the question as to what is a "fact" and "reality" in its own way. And the main question may be determined as the understanding of whether or not these concepts possess the finality which they are attributed to [5. p. 282].

But within the views of Gilson, Shestov also perceives something very close to himself. The most important moment for Shestov, very accurately remarked by Gilson, points to the fact that our concepts "creak at the seams when we attempt to cram them into the content of the Scriptures" [2. p. 33–34].

The personality of Luther which in Gilson's work is opposed to scholasticism, for Shestov has always been very controversial. It is undisputed fact that Luther's doctrine is a complete contrast to the objectives of scholasticism. However, Shestov, just as Gilson, can say that a consistent Lutheran is a "rarissima avis" [5. p. 297]. Nevertheless, Luther like no other tries to move away from knowledge. He is afraid of it, and his whole being frantically aspires to faith. The reason which we believe is a natural conductor, actually leads us to death. The law we rely upon only leads to multiplication of criminal knowledge.

Work on the analysis of Gilson's views very fascinated Shestov. In a letter to B. Schlözer (November 3, 1934), he writes: "... a huge amount of material is accumulated; I do not know how everything fits in one article, even in a large one. And I do not know how to arrange it, so that the readers who are accustomed to the "evidence" could realize that the evidence does not prove anything and only destroys what is most important for a person" [1. p. 132].

Unfortunately, with these publications and the exchange of polite letters the close contact between the Russian thinker Lev Shestov and the young French philosopher and historian Etienne Gilson comes to an end. Hereafter, they went their own ways. And while Shestov is still more drawn to Jerusalem in the issue of commonality between Athens and Jerusalem, Gilson finds his own answer in this dilemma: "Rome" [1. p. 136].

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Section 12. Chemistry

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Minireview of potentially low cost biosorbents from natural products for removing of heavy metals

Abstract: Industrial effluents loaded with heavy metals are a cause of hazards to human and other forms of life. Conventional methods such as precipitation, evaporation, electroplating, ion exchange, membrane processes, etc. used for removal of heavy metals from waste water however, are often cost prohibitive having inadequate efficiencies at low metal ion concentrations. Biosorption can be considered as an alternative technology which has been proved as more efficient and economical for removal of heavy metals from the industrial waste water. The most frequently used biosorbents are bacteria, fungi, algae and yeasts. But more recently, low cost natural products have also been searched as biosorbent. This paper presents an overview of the potential use of some natural products as biosorbent which could serve as a cost effective means of treating effluents charged with toxic heavy metals.

Keywords: biosorbent, heavy metals, waste water, industrial effluent, natural products.

Introduction

Heavy metals are a group of pollutants which occur as natural constituents of the earth's crust. Serious consequences of biological hazards caused by metal toxicity cannot be ruled out. A high degree of industrialization and urbanization has substantially enhanced the degradation of aquatic environments through the discharge of industrial waste water and domestic wastes. This has resulted in significant amount of heavy metals being deposited into natural aquatic and terrestrial ecosystems. It has also increased the biological cycling of toxic heavy metals. In view of this, there is an urgent need for removal of heavy metal contaminants.

Conventional methods for heavy metal removal from aqueous solution include chemical precipitation, electrolytic recovery, ion exchange/chelation and solvent extraction/liquid membrane separation [28]. But these methods are often cost prohibitive having inadequate efficiencies at low metal concentrations, particularly in the range of 1–100 mg/l [19]. Some of these methods, furthermore, generate toxic sludge, the disposal of which is an additional burden on the techno-economic feasibility of treatment procedures. These constraints have caused the search for alternative methods that would be efficient for metal sequestering. Such a possibility offers a method that uses sorbents of biological origin [5; 6; 22] for removal of heavy metals from dilute aqueous solutions. The most frequently studied biosorbents are bacteria, fungi and algae [10; 14; 16; 24; 32]. But more recently, the search

for new cost effective biosorbents involving removal of toxic metals from waste water/effluents has directed attention and natural sorbents are searched among many waste materials from food and agricultural industry. These materials can be considered as low cost sorbents [9] and require little processing, abundant in nature or are a by-product or waste material from some industry [5; 7].

Natural Products as Biosorbents

Crab shell

Utilization of crab shell for biosorption of copper (II) and cobalt (II) was investigated by Vijayaraghavan et al [34]. At optimum particle size (0.767 mm), biosorbent dosage (5g/l) and initial solution pH (pH 6). crab shell recorded maximum copper and cobalt uptakes of 243.9 and 322.6mg/g, respectively. Among the several eluting agents, such as HCl, H₂SO₄, HNO₃, CaCl₂, NaCl, NH₄Cl, NH₄OH, NaOH, EDTA (Na) and EDTA (Na)/HCl, EDTA (pH 3.5, in HCl) performed well and caused low biosorption damage. The biosorbent was successfully regenerated and reused for five cycles.

The carapace of the crab (*Cancer pagurus*), a waste material disposed of by the seafood industry, could serve as a viable, cost effective biosorbent for the removal of metals from aqueous media. In sequential-batch process Zn²⁺ uptakes of 105.6 and 67.6 mg/g were recorded for 0.25–0.8mm and 0.8–1.5mm particles, respectively, while values of 141.3 and 76.9 mg/g were recorded in fixed-bed column studies [33].

Fish scales

The feasibility of using fish scale as an adsorbent to remove heavy metals was examined by Mustafiz [26]. Biological effects on adsorption of heavy metals such as lead, arsenic and chromium were studied using Atlantic Cod scale. The difference in results between non-sterilized and sterilized experiments showed the microbial contribution to heavy metal removal.

Egg shell

The crushed egg shells possess relatively high sorption capacity of Cr (III) ions [11]. When compared with other sorbents, it was found that sorption capacity increased with the increase of Cr (III) concentration, temperature and sorbent concentration. Egg shells were able to remove the concentration of Cr (III) ions below the acceptable level i. e. at 40 °C, at the initial metal ion concentration 100 mg/kg, at sorbent concentration 15g/l.

Coconut copra meal

Coconut copra meal is a byproduct of coconut production and is characterized by functional groups such as alcohols, hydroxyls, carboxylic acids, etc. on its surface. Its effective use as a biosorbent for the removal of heavy metals like cadmium was investigated by Hofomaja and Ho [15]. Cadmium biosorption by coconut copra meal was found to be dependent on the initial solution pH and initial cadmium concentration. Mathematical relationships were drawn to relate the change in the solution hydrogen ion concentration with equilibrium biosorption capacity, initial cadmium concentration and equilibrium biosorption capacity.

Papaya wood

Papaya wood was evaluated as a new biosorbent of heavy metals [29]. On contacting with 10mg/l copper (II), cadmium (II) and Zinc (II) solutions with 5g/l papaya wood, during shake flask contact time of 1 hour, the respective metal removal was noted to be 97.8, 94.9 and 66.8%. Sorption was most efficient at pH5 and metal ion biosorption increased as the ratio of metal solution to the biomass quantity decreased. At equilibrium, the affinity of papaya wood to biosorp metals was in order of copper (II) > cadmium (II) > zinc (II), which remained the same during the testing of variables of different factors.

Sunflower stem

The sorption potential of sunflower stem for Cr (III) ions was investigated in detail by Malik et al. [23]. The stem was washed with water and dried in air and inner soft tissue was removed and outer hard tissue was chopped up to 1 cm length, washed and deionized with water, dried in oven at 105 ± 5 °C and ground in a blade mill. The powder was sieved into different fractions (180–300 μm). The maximum sorption (>85%) of Cr (III) ions (70.2 μm) has been accomplished using 30 mg of high density sunflower stem in 10 min from 0.001 M nitric and 0.0001M hydrochloric acid solutions.

Cork biomass

Cork oak tree is very abundant in several countries which develop bottle cork for the wine industry. The effect of pretreatment of cork biomass on the biosorption of heavy metals, such as Cu, Zn and Ni was studied by Chubar et al [12]. The

pretreatment of the cork biomass with 0.5 M sodium chloride solution led to an increase of 30% of cork sorption capacity for copper, while the pretreatment with 0.5 M calcium chloride solution did not improve significantly the performance of biomass. The use of oxidizing agents (NaClO and NaIO_3) in the pretreatment step allowed an increase of the sorption capacity of the biomass.

Petiolar-felt-sheath of Palm

The petiolar-felt-sheath of Palm (PFP) was reported as a new biosorbent for the removal of heavy metals from contaminated water [17]. Biosorption of heavy metals such as Pb (II), Ni (II), Cd (II), Cr (III) and Zn (II) by PFP was examined and efficient removal of all the toxic metals ions with selectivity order of $\text{Pb} > \text{Cd} > \text{Cu} > \text{Zn} > \text{Ni} > \text{Cr}$ was found. The uptake was rapid, with more than 70% completed within 15 minutes. The bound metal ions were successfully desorbed and the PFP biomass remained effective after several adsorption desorption cycles.

Arca shell

The biosorption potential of pretreated arca shell biomass for lead, copper, nickel, cobalt and cesium was explored from the artificially prepared solution containing known amount of metals [13]. At equilibrium, the maximum total uptake by shell biomaterial was 18.33 ± 0.44 ; 17.64 ± 0.31 ; 9.86 ± 0.17 ; 3.93 ± 0.11 and 7.82 ± 0.36 mg/g for lead, copper, nickel, cesium and cobalt, respectively under the optimized condition of pH, initial concentration, biosorbent dose and contact time.

Rice bran

The capacity of raw rice bran for chromium and nickel removal from aqueous solutions was investigated by Oliveira et al [27]. The Langmuir and Freundlich adsorption models, which are in common use for describing sorption equilibrium for wastewater treatment applications, were used to represent the experimental data and equilibrium data fitted well to the Freundlich isotherm model. Cr (VI) and Ni (II) were sorbed due to strong interactions with active sites of the sorbent.

Rice husk

The ability of rice husk to adsorb Cd (II) from water has been explored by Ajmal et al. [2]. The extent of removal depends on concentration of the solution, pH, temperature and contact time. The adsorption model followed the Langmuir isotherm. Removal efficiency by column process is better than by batch process.

Wheat shell

The biosorption of copper (II) by wheat shell was reported by Basci et al [8]. Maximum biosorption of copper onto wheat shell occurred at 240 rpm agitation speed and at between 5 and 6. The biosorption values of copper (II) were increased with increasing pH from 2 to 5 and decreased with increasing copper/wheat shell sorption capacities from 0.83 to 10.84 mg Cu (II)/g wheat shell. The biosorption efficiencies at these ratios were 99 and 52%, respectively.

Husk of Bengal and Black gram

The potential to remove Cr (VI) from aqueous solutions through biosorption using the husk of Bengal gram (Cicer

arietinum) was investigated in batch experiments by Ahalya et al [1]. The results showed removal of 99% of chromium in the 10mg/l chromium solution, the biomass required at saturation was 1 g/mg. The biosorptive capacity of the sorbent was dependent on the of the chromium solution, with pH 2 being the optimal. The adsorption capacity increased with the increase in agitation speed and optimum was achieved at 120 rpm. The biosorption of Cr (VI) was studied by Fourier transform infrared spectroscopy (FTIR). Husk of Bengal gram was proved to be an excellent material for biosorption of Cr (VI) to treat waste water containing low content of metal.

Black gram husk [*Vigna mungo*] efficiently remove heavy metal ions from aqueous solutions with selectivity order of Pb > Cd > Zn > Cu > Ni. The biosorption increased as the initial metal concentration increased. Biosorption equilibrium was established within 30 min, which were well described by Langmuir and Freundlich adsorption isotherms. The maximum amount of heavy metal adsorbed at equilibrium was 49.97, 39.99, 33.81, 25.73 and 19.56 mg/g biomass for Pb, Cd, Zn, Cu and Ni, respectively. The biosorption capacities were found to be pH dependent and the maximum adsorption occurred at the solution pH 5 [30].

Sugar beet pulp

Dried sugar beet (*Beta vulgaris*) pulp, an agricultural solid waste by-product, was used as an biosorbent for the removal of copper (II) from aqueous solution [3]. The results indicated that at 250 mg/l copper (II) concentration dried sugar beet pulp exhibited the highest copper (II) uptake capacity of 28.5 mg/g at 25 °C and at an initial pH value of 4.0. The Langmuir model was found to be best.

Black tea leaves

Sorption of Cr (VI) on used black tea leaves as a low-cost adsorbent was studied by Kumita et al [20]. Batch experiments were conducted to evaluate the effects of Cr (VI) concentration, solution and temperature on the removal process. The maximum Cr (VI) adsorptive conditions, with a minimum reduction, were achieved from the dynamics of operational parameters: the initial Cr (VI) concentration

<150mg/l; the initial solution pH 1.54–2.00 and the processing temperature <50 °C, for the possibility of its practical application.

Coffee beans

The biosorption of metals such as Cu (II), Zn (II), Pb (II), Fe (III) and Cd (II) is reported by using discarded coffee beans [18]. Using dropped and degreased coffee beans (DCB) as an adsorbent batch adsorption experiments were carried out at various pH in order to elucidate the selectivity of metal ions. All metals were adsorbed at low pH region (3.0–5.0). Of particular interest was the adsorption characteristics of cadmium (II) on DCB. The reaction mechanism was found to be an ion exchange reaction between metal ions and DCB.

Coconut shell carbon

The biosorption of Zn (II) from aqueous solution by a composite adsorbent (chitosan-coated acid treated coconut shell carbon) is reported [4]. Coconut shell carbon was modified with chitosan and/or oxidizing agent (phosphoric acid) to produce composite adsorbent. The removal efficiency was controlled by solution pH, adsorbent concentration and agitation times, initial ion concentration and particle size.

Cocoa shells

The efficiency with which cocoa shells remove heavy metals from acidic solutions (pH 2) and how the composition of these solutions influence the heavy metal uptake efficiency is reported [25]. The removal of metals from aqueous solutions followed a specific order of

Pb > Cr > Cd = Cu = Fe > Zn = Co > Mn = Ni = Al.

Waste fruit residues

Biowaste obtained from fruit juice industry was evaluated as a new biosorbent for removal of toxic heavy metals, Hg (II), Pb (II), Cd (II), Cu (II), Zn (II) and Ni (II) [31]. The removal efficiency of phosphated fruit residues (P-FR) was higher than fruit residue (FR) especially at low pH values. The order of removal of heavy metal by P-FR was Cu (II) > Pb (II) > Ni (II) > Zn (II) > Hg (II) = Cd (II).

Table 1 summarizes the biosorption capacities/efficiencies of natural products discussed above.

Table 1. – Natural products used as biosorbents for removal of heavy metals from aqueous solutions

Biosorbents (Natural products)	Metals	Adsorption Capacity (mg/g) /Efficiency (%)	References
1	2	3	4
Black tea leaves	Cr (VI)	364 mg/g	[20]
Cocoa shells	Pb (II); Cr (III); Cd (II); Cu (II), Fe (II); Zn (II); Co (II); Mn (II); Ni (II); Al (III)	Pb 95; Cr 53; Cd 81; Cu 70; Fe 45; Zn 64; Co 57; Mn 53; Ni 50; Al 15 (%)	[25]
Coconut copra meal	Cd (II)	1.70 mg/g	[15]
Coconut shell carbon	Zn (II)	90%	[4]
Coffee beans	Cu (II); Zn (II); Pb (II), Fe (III) and Cd (II)	$5.98 \cdot 10^{-2}$ mmol/g	[18]
Crab shell	Cu (II) Co (II)	243.9 mg/g 322.6 mg/g	[34]
Egg shell	Cr (III)	160 mg/g	[11]
Husk of Bengal gram	Cr (VI)	99%	[2]
Husk of Black gram	Pb (II); Cd (II); Zn (II); Cu (II); Ni (II)	49.97; 39.99; 33.81; 25.73; 19.56 (mg/g)	[29]

1	2	3	4
Papaya wood	Cu (II); Cd (II); Zn (II)	97.8; 94.9; 66.8 (%)	[30]
Sugarbeet pulp	Cu (II)	28.5 mg/g	[3]
Sunflower stem	Cr (III)	85%	[26]
Waste fruit residues	Hg (II); Pb (II); Cd (II); Cu (II); Zn (II); Ni (II)	Hg 85; Pb 90; Cd 86; Cu 96; Zn 87; Ni 85 (%)	[31]
Wheat shell	Cu (II)	99%	[8]

Conclusion

The research reports summarized in this article have highlighted the potential use of natural products as biosorbent of heavy metals which represents a cost effective excellent tool

for removing heavy metals from aqueous environment. Mathematical modelings are definitely helpful for biosorption process optimization.

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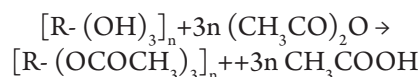
Obtaining of inulin acetate

Abstract: In the article first obtained inulin ester — inulin acetate, by etherification of inulin with acetic anhydride has been exposed. Obtained product has been studied using elementary analysis and IR — spectroscopy.

Keywords: inulin, acetic acid, acetic anhydride, moisture, sulfuric acid, acetamide, acetylation, inulin acetate.

In previous work [1, 401–402] we have shown the possibility of obtaining inulin ether — nitroinulin. In order to expand the derivatives of inulin in this paper shown results of investigations to obtain inulin acetate. Now, the basic reagent used for acetylating is the acetic anhydride applied at acetylation of cellulose.

Acetylation of inulin spent acetic anhydride in a solution 60%-s' acetic acids. Reaction proceeds under the following scheme:



Allocated at acetylation of acetic acid, is the solvent, formed acetate inulin. As the reaction catalyst acetylation the widest application was received by mineral acids, in particular, sulfuric acid. The role of sulfuric acid in the process of acetylation essentially differs from its role at nitration of inulin. As we marked before [2, 37–41; 3, 104; 4, 131–132], at nitration of inulin in the structure of nitrate mixes the significant

amount of sulfuric acid (to 60% from all nitrate mixes) is input and its basic purpose in a mix — to increase swelling of inulin and to reduce the nitric acid expense (at the same module of a bath). Presence of sulfuric acid in nitrate mixes does not influence considerably on conditions of nitration of inulin. Nitration of inulin as it was specified in work [5, 24–27], can be carried out with the same speed and one nitric acid. Hence, sulfuric acid at the nitration process is not the catalyst. At the acetylation of inulin in the structure of mix the small amount of sulfuric acid of 3–12% (from weight of inulin), not causing appreciable increase in swelling of acetylated object is input.

As opposed to nitration, at the acetylation of inulin the presence of sulfuric acid in the structure of etherification mix is necessary. At the acetylation of inulin sulfuric acid is the active catalyst, besides it is quite accessible. Hereby it is also spoken its wide application at acetylation of polysaccharides, in particular, cellulose.

Except the catalyst, on the speed of acetylation process, also the big influence renders humidity of inulin. The above humidity of inulin, more its swelling and that occurs acetylation faster. Figure 1 shows the dependence of acetylation speed from the moisture content in the inulin.

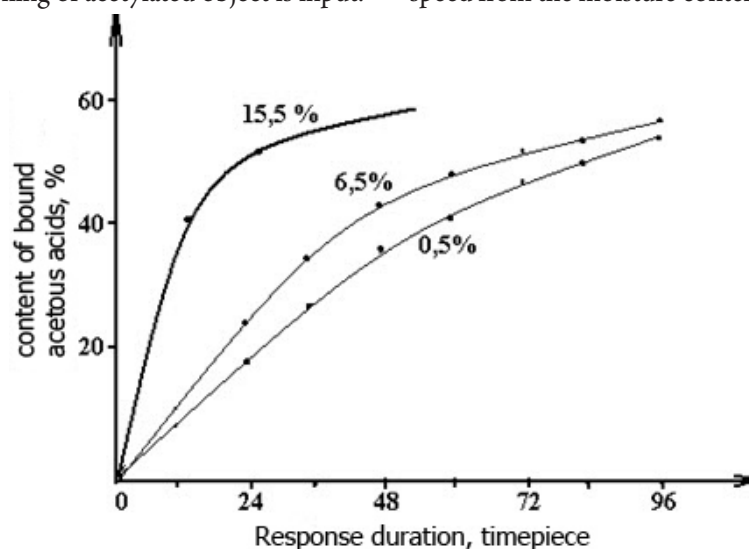


Fig. 1. Influence of inulin moisture on its acetylation speed.

Apparently from drawing, the humidity increase of inulin leads to acceleration the reaction of acetylation.

However, application for acetylation of inulin with the raised humidity is inexpedient, as thus the expense of acetic anhydride in the reaction with the water which is in inulin considerably increases.

It is more expedient to carry out preliminary swelling of inulin in ice acetic acid. As a result of this processing speed of acetylation process, spent to the same conditions, raises

several times. The quantity of the acetic acid applied to preliminary swelling of inulin, is considered at the subsequent addition of acetylated mixes. Hence, the specific expense of reagents at acetylation does not raise. This method of activation has received the widest application by the manufacture of acetyl cellulose.

The first stage at obtaining acetates of inulin is hydration of acetic anhydride, i. e. interaction of the water which are in a mix with a part of acetic anhydride.

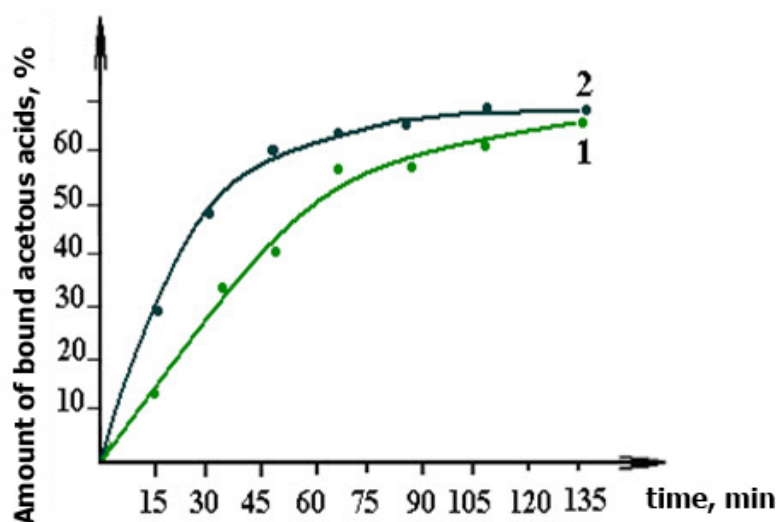


Fig. 2. Dependence of the amount bounded acetic acid for catalyst type.
1 — Catalyst H_2SO_4 ; 2 — catalyst H_2SO_4 : acetamide (1:2)

Acetylation reaction of inulin begins with a powder surface. In the process of acetateinulin formation its macromolecules are dissolved in acetylated mixes and liberate hydroxyl groups of inside layers of inulin powder. Thus, in the acetylation process completely proacetylated molecules of inulin pass in a solution.

After acetylation reaction end the product precipitate in the distilled water, a deposit filter and wash out water for the purpose of removal of acetic acid, mineral acids, acetamide, and partially, low-molecular fractions of inulin acetates.

Acetic anhydride in the absence of catalysts co-operates with inulin very slowly, therefore at the reception of acetates, it is necessary to use catalysts — mainly sulfuric, chloric acids or their mixes.

Application of chloric acid at obtaining inulin acetates an acetic method in some cases leads to gelatinization of the obtained syrup. In practice, as a rule, the mixtures of chloric and sulfuric acids are used.

Recently more often steels to apply acetamide (CH_3CONH_2) which is used in the form of a solution in a mix of acetic acid and acetic anhydride where its basic property amplifies also it can enter reaction with protons of acids.

Figure 2 shows the acetylation of inulin using acetamide as the catalyst.

This is due, seems, the fact that the role of acetamide is binding greater portion of the catalyst in the initial stage of acetylation and a deceleration rate in the final period of the acetylation reaction. In the process of increase in temperature and the expense of acetic anhydride at the expense of complex disintegration the additional quantity of the catalyst that allows finishing completely acetylation process is allocated.

As a result of acetylation it turns out acetateinulin with degree of polymerisation 27–32, with the maintenance of the connected acetic acid to 61–62%. The obtained powder washes out cold water before neutral reaction.

In figure 3. the IR-spectrum of acetateinulin where there is a peak of absorption in the region of 3421 cm^{-1} which characterises the presence of free hydroxyl groups is resulted. Such spectra are characteristic to the samples, obtained with insufficient quantity of acetic anhydride. There are strips of absorption of 2925 cm^{-1} — for intracomplex groups; 2032 cm^{-1} — for primary- OCOCH_3 groups; 1738 cm^{-1} — for CH_2 — OCOCH_3 groups; 1133 cm^{-1} , characteristic for $(\text{C} - \text{O} - \text{C})$ bonds; and also 935 cm^{-1} — for α — polysaccharides;

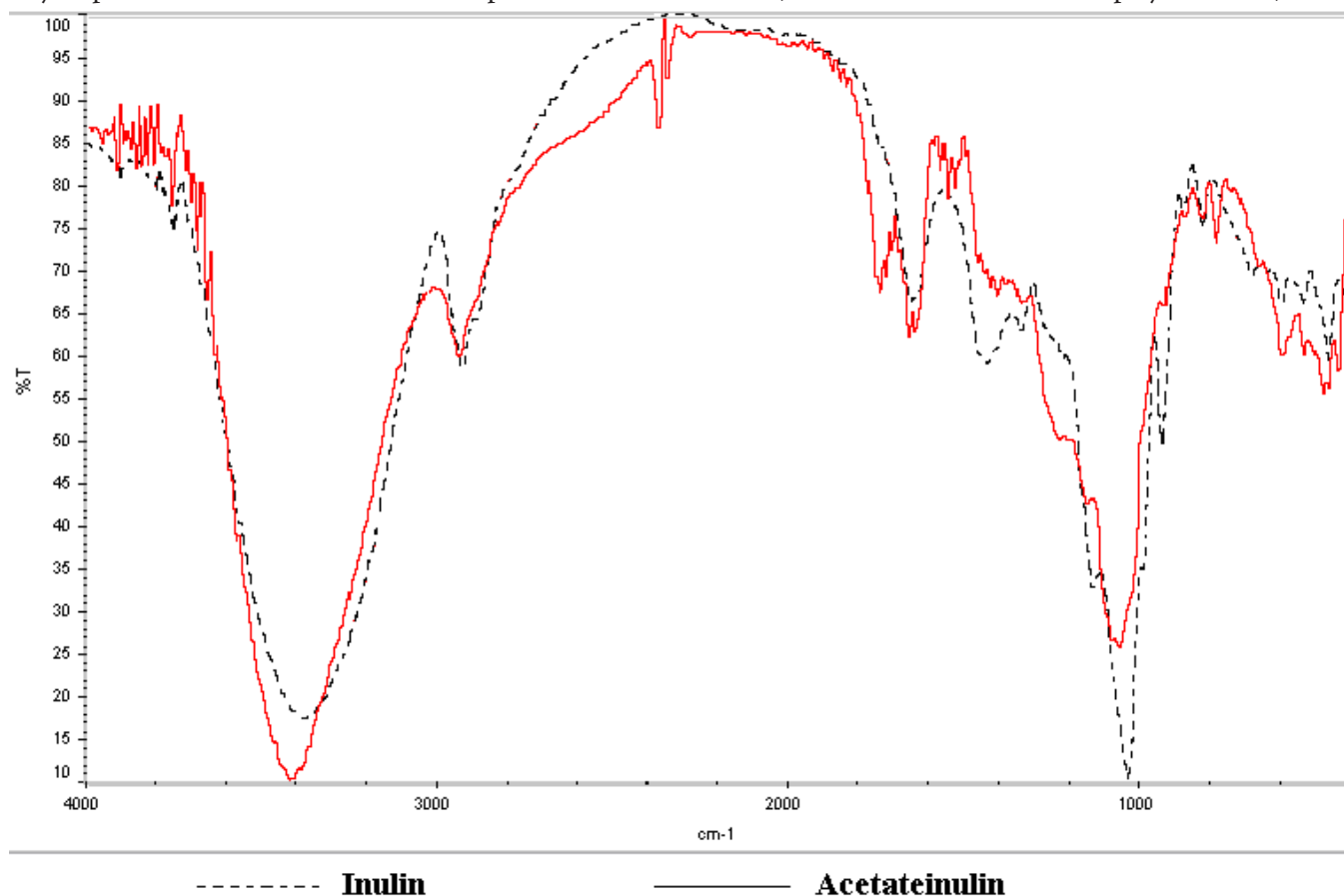


Fig. 3. IR — spectrum of acetateinulin

Acetateinulin (Inulinacetate) — a difficult ether of organic acid and polysaccharide — inulin, containing a little — OCOCH_3 radicals with molecular weight 9000–11000, a representing loose powder of dark brown colour. It has humidity of 3,78% which defined by hydrometer — «Sartorius Ab COT-

TINGEN», Germany, at temperature 105°C , fusion temperature defined by the device of firm «BUCHI» Switzerland, BUCHI Melting point B-540, ($0^{\circ}\text{C} - 540^{\circ}\text{C}$), $T_{\text{m}} = 238,7-240,6^{\circ}\text{C}$. Acetateinulin under the resorcin action and hydrochloric acid it is not painted in red colour (Selivanov's reaction).

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Section 13. Economics and management

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Rent relations and investment attractiveness of peat extraction: nature of interrelation *

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Abstract: The article discusses the general history of development of views on the concept of rent and rent relations. The analysis of the economic condition of the peat industry is presented. It is proposed to use the mechanism of rent relations in the peat industry to increase its investment attractiveness.

Keywords: rent, peat industry, efficiency, investment climate.

Russia has the largest peat reserves in the world and, according to different estimates, takes the first-second place in the world. According to the presented data, its share in total world reserves accounts for 40 to 60%. Balance peat reserves in Russia are estimated 30.8 billion tons, 40% of arbitrary moisture or over 10.7 billion tons of arbitrary fuel. Around 60% of total peat reserves are evaluated as potentially extractable, according to technological factors [1]. Accordant with this indicator, Russia takes a leading position in the world and the peat extraction is concentrated in more than 20 regions of the Russian Federation. By the end

of eighties of the previous century, 50 million tons of peat for fuel and agricultural needs were annually extracted in Russia [2]. However, in the last years there has been a reduction in volume of extracted peat. The biggest drop fell for 2002–2003, when the peat production accounted for only 37.8% of the level of 2000, and, further, by 2009, the production volume was only 1.2 million tons [1]. In 2013 Russia produced 2.65 million tons of peat of different industrial purpose.

Same tendencies are observed in peat extraction regions, for instance, Tver region (see Table 1).

Table 1. – Peat extraction in Tver region from 1971 to 2013

Year of extraction	Tver region			
	Total, thousand tons	Fuel thousand tons	Sod thousand tons	Agricultural thousand tons
1	2	3	4	5
1971–1975	25764	15676	114	9974
1976–1980	20720	10837	16	9857
1981–1985	21732	6998	18	14716

1	2	3	4	5
1986–1990	21019	5621	24	15374
1991–1995	6539	2952	24	3563
1996	807	762	15	30
1997	325	259	5	61
1998	219	120	7	92
1999	534	421	13	100
2000–2009	210	90	20	100
2010	132	50	42	40
2011	155	63	55	37
2012	162	71	58	33
2013	176	77	63	36

As it can be seen in Table 1, already in the seventies and eighties there was some reduction in the rates of peat production. Herewith, together with the reduction of total volume of extracted peat, including fuel peat, the production of peat of agricultural purposes increased. However, in the early nineties, peat production decreased by 3,2 times, including the drop of peat production for agricultural purposes by 4,3 times. The higher reduction rate of peat production was typical for the further period, especially for the first decade of the new century. Thus, the average annual peat production in 1999 decreased by almost 2,5 times, including fuel peat by 1,1 times and agricultural peat by almost 7 times, and by 2010, there was a respective drop by over 25 times compared to 1999 etc. In 2013 there was a slight increase in the volumes of peat extraction and, according to forecasts, the volume of peat extraction will reach the level of 265 thousand tons by only 2020. Therewith, if in the nineties of the last century over 300 peat enterprises were functioning actively in the peat industry in Russia (over a dozen of enterprises were engaged in the peat business in Tver region), henceforth there was a tendency for reduction of their number. As of the beginning of 2014, there are 105 enterprises in the peat industry, i. e. their number decreased by almost three times (see Table 2).

This situation is largely explained by the fact that the conditions of economic management have changed. During the pre-reform period the peat extraction was mainly performed by agricultural entities and industrial organizations of the Ministry of peat industry of the Russian Federation,

i. e. state enterprises. Until 1990s, the peat industry in the conditions of then management system referred to planned loss-making, subsidized industries and was supported by the state. The volumes of extraction were established by the state plan. It was divided between the republics and their ministries passed planned indicators to the enterprises. Herewith, in practice, the production cost of extraction and delivery of products to consumers exceeded the normative figures. The excess was compensated at the expense of net income received both by means of production and realization of goods of national consumption (alimentary and household products) and supplies of peat fuel to boiler houses designed to burn peat [2; 4]. Additional activity of peat enterprises brought them up to 50% of profit, which helped many of them meet the planned figures.

During the pre-reform period, peat enterprises were large organizations. They had over 100 units of trunk tractors with a set of attachable equipment for peat extraction, machinery repair shops, warehouse sites and depots, engineering and social infrastructure facilities, residential buildings, boiler houses etc. Their mean annual production volume amounted for more than 500 thousand tons.

The number of production staff at a peat industry enterprise was over 150 people at average.

Today, the major part of peat entities is in private possession and only 16 of operating enterprises have a share of federal or municipal ownership, which fluctuates between 20 to 100 percent [2; 3; 4].

Table 2. – Number of peat industry entities

Organizational and legal form	Number			Industry structure, %		
	2010	2012	2014	2010	2012	2014
LLC	144	123	58	64,0	63,1	55,2
CJSC	28	21	17	12,4	10,8	16,2
OJSC	37	45	30	16,4	23,1	28,6
State company, Municipal company	16	6	-	7,1	3,1	-
Total	225	195	105	100	100	100

The transition to market economy that began in the country in the early nineties was accompanied by the collapse of economic relations formed in the conditions of command and control economy, the end of financial support of peat industry enterprises, the loss of market outlets, all the more so, because

the main consumers of peat products, agricultural enterprises, became insolvent and most of them went bankrupt. Almost all orders for the supply of fuel peat stopped as, with a switch to gas, most boiler houses were reequipped and stopped the usage of peat as fuel.

The drastic decrease in the volumes of peat extraction, constant non-payments by municipal entities for communal and household fuel, credit indebtedness of power stations for the supplied peat that exceeded 100 million rubles put the peat industry to the edge of bankruptcy. The condition was deteriorated by the fact that almost all peat enterprises had 100% rundown fleet of machines, mechanisms and equipment; hence, there was a need for investment in the fixed assets. Territorial remoteness of enterprises and their hard economic condition created a personnel problem — lack of qualified staff for all positions. And, this is with the assumption that in the 1980–1990s, operating at full capacity, the peat industry enterprises kept a then normal salary level, which determined the absence of personnel problems [4].

The entities developing peat raw material are characterized by less effectiveness, outdated material and technical base and loss of qualified staff. They carry a hard tax and rent burden. Compared to other enterprises of the mining sector, they are not attractive for investors.

As a result, the process of withdrawal of a considerable number of peat deposits, which are well explored and potentially productive, from the economic turnover continues.

Thus, such financial and economic situation in the country's economy in the whole and in the peat industry in particular as well as passing of peat enterprises into private ownership accompanied by the loss of the state support have led to significant reduction of the industry in all parameters.

In addition, as the foreign practice shows, peat business is a quite marketable and promising kind of economic activity.

Some countries didn't only reduce the volumes of peat production, which is a common worldwide tendency in the last 25 years, but, on the contrary, elevated its production. The volumes of peat extraction in the 2000s rose: in Latvia by 68%, in Sweden by 44%, and in Poland by 25%, in Belarus by 23%. Herewith, in the first decade of this century approximately 70% of the world peat produce was intended for the production of heat and electric energy, and the rest 30% was intended for the needs of agriculture. Finland is the world leader in peat production with 36.4% of total world production; the second place is taken by Ireland with 17.2% and the third place is kept by Belarus with 10.4%. According to the volume of peat extraction, Russia takes the 4th place with only 4.8% of world production [1]. And, it is so given the world leadership in the peat reserves, as it was mentioned earlier.

Moreover, as the practice shows, in certain conditions enterprises can reach a high level of efficiency of production factors and, in the end, marketability, which fluctuates between 30 to 40 percent. Some do not have a marketability level higher than 3–10 percent. Such sharp fluctuations in marketability can be explained by differences in natural resources and, primarily, resources, which determine the quality characteristics of deposits such as, for instance, types, capacity, dampness and stumpy characteristic of a peat deposit, the level of peat decomposition, its botanical composition etc. [5; 2].

On the basis of the above stated, it follows that the rebirth and development of the peat industry is prevented by the pendency of problems, such as:

- absence of understanding of the role and place of peat and peat deposits in the country's economy;

- absence of clear and effective economic policy with regard to the peat industry and enterprises, including the distribution of the received profit between the owner of deposits and entrepreneurs;

- presence of highly rundown and almost non-renewable fleet of machines;

- absence of an opportunity of investment, motivation and incentives for investment attraction;

- constantly growing prices on fuel, combustive and lubricating materials, spare parts for machines and equipment;

- low demand for products caused by the lack of new opportunities of peat produce realization;

- actual degradation of peat machine engineering and, consequently, the lack of supply in equipment, let alone innovations;

- lack of professional staff at peat enterprises due to reduction of their training as well as the drain of employable population to more stable and highly paid industries;

- lack of investment into scientific researches and project construction solutions;

- overcharged, often unreasonably, rent and rent-related payments, which is a factor preventing investment.

In order to solve the outlined problems, a reformation of the economic policy with regard to the peat extraction industry is required. One cannot say that nothing is done in this area.

The issue about the need to support the industry and expand its investment and innovation potential is actively discussed. In some regions of the country the programs of the peat industry development are developed as priority [6–9]. The propositions on creation of peat and bio-energetic clusters are explored. However, there are no convincing grounds for economic efficacy of concrete cluster forms of organization of the peat business. Furthermore, the issue about passing of several Federal laws, such as: «About some measures of stimulation of peat application in energy development», «About the peat», «About extraction, transportation and usage of peat» is still at the stage of discussion.

It appears that the pendency of most practical issues of rebirth and development of the peat industry is primarily explained by the insufficient development of theoretical problems of economic relations formed between the participants of the process of production of mineral resources and, particularly, peat extraction in the process of transition to the market economy. Hence, the concept of interrelations between business subjects in the given type of activity that is reliable and accepted by scientists and experts as well as a concrete economic mechanism meeting the changed business conditions haven't been worked out yet.

It should be noted that activation in researches, conduction of scientific and practical conferences, forums and exhibi-

tions dedicated to economic problems of the peat business have been observed for quite a long time. Particularly, the attention is called to the growth of dissertation researches on mining rent [4]. However, in the last 20 years the theory of rent relations is considered and developed predominantly in the industrial aspect. Herewith, the attention is mainly paid to the peculiarities of manifestation of rent relations in concrete mining industries such as coal, oil and gas, ore and so called nature exploited industries. Specifically, in non-ore, peat or forest procurement. However, firstly, the flow of dissertation researches on the problems of the first group of industries is more intense, and the intensity of dissertation researches of the second group is significantly lower and there are few dissertation works. Secondly, there is an evident deficit in the development of theory and methodology of rent relations, i. e. general regularities of functioning and development of productions, in which land is one of the most important production factors.

Drawbacks in the methodological projects considerably explain the irrationality of the formed organizational and economic relations and methods of profit distribution from mining activity. Thus, for instance, from January 1, 2012 till date the differential mining rent I (it is unclear how it is defined and there is a question if it is so) is collected in favor of the state (as a land's owner) in the form of a tax on extraction of mineral resources (TEMR). Although, the confusion in the law «About the mineral resources» and established fiscal methods of TEMR collection and division of incomes from the entrepreneurial profit make many mining industries, including the peat industry, ineffective and even loss-making [3, 10].

This being said, the issues of rent relations of the second matter considerably affecting the investment attractiveness of the given type of activity have not yet become the objects of attention, let alone their deep scientific work-out, and **are quite current from the scientific point**.

In this respect, it appears that primary solution of a triunique task is required with regard to the mining rent of the second matter:

Firstly, work out methodological basics of reformation of economic, primarily rent, relations between the subjects of business activity in the mining industry and the specific of their manifestation in the peat industry;

Secondly, validate the economic mechanism ensuring motivation and incentives of investment attractiveness in the sphere of exploration of mineral deposits; and

Thirdly, define and involve concrete measures on rebirth and development of the peat extraction industry during the working out of industrial and investment policy.

Essentially, that entails the creation of an appropriate mechanism of agreement and realization of interests of all

subjects of the mineral raw material complex and, primarily, **owners** of deposits and directly **business subjects** (entrepreneurs) ensuring motivation and interest of the latter to invest.

It should be noted that these tasks were undertaken by us during the pre-reform period (see also [5]). Although, the investigations of the indicated problems in the conditions of command and administrative economy had, as a rule, academic character, because rent relations are fully typical only for market system of business by definition. Hence, new approaches are required in the new economic conditions and our initial positions in the consideration of the established problems lie in:

— the establishment of an interrelation between the level of attractiveness of the investment climate and reduction of the investment risks on the one side, and rent relations on the other side; and on the basis of that –the development of ensuring measures on motivation and incentives for investment;

— the usage of new approaches [11] towards the structuring and analysis of groups of factors determining the nature of investment attractiveness as well as development of concrete propositions and recommendations on the improvement of investment attractiveness resulting from the analysis, which should be performed at all hierarchy levels of management;

— the usage of the original algorithm and method developed by the authors based on «AVS — matrix» (see, for instance [11]) for the analysis of the investment climate in the peat industry, the rights on which, as a result of an intellectual activity, are protected by the Certificate of the Russian Authors Society (RAS) [12];

— the validation and application of a theoretical provision about the fact that the value of a mining rent should be established as interest from the cost estimation of a unit of square of a deposit site, because, it is in the form of payment for land resources by definition, and the price of a deposit site takes a form of a capitalized mining rent;

— the development of an algorithm and method of division of net profit into two parts, one of which (entrepreneurial income) is created under the influence of such factor as capital, and the other one (rent) is created under the effect of another factor — deposit of a mineral resource;

— the validation of method of definition of terms of a rent agreement and size of a rent payment built on the basis of adherence to the balance of interests of the owner of a deposit and entrepreneur-rent holder;

— the author's approach towards the formation of an investment strategy taking into account the rent component in the profits of enterprises of the peat extraction industry.

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Tragedy of the commons relative to waste disposal in Jordanian Al-Tafilah

Abstract: The tragedy of the commons relative to waste disposal in Al-Tafilah is examined in the article. It is constructed so as to answer overarching questions: what do we know? why do we care? what can we do? To solve waste disposal problem in Al-Tafilah the author suggests implementing two projects: deposit-refund system for packaging; and composting and biogasification of biological waste.

Keywords: commons, waste, pro-social behavior.

The tragedy of the commons, discussed by Garrett Hardin in his famous article reappears in problems of pollution. Here it is not a question of taking something out of the commons but of putting something in sewage; chemical, radioactive and heat wastes into water; noxious and dangerous fumes into the air; and distracting and unpleasant advertising signs into the line of sight. The rational man finds that his share of the cost of the wastes he discharges into the commons is less than the cost of purifying his wastes before releasing them. Since this is true for everyone we are locked into a system of “fouling our own nest”, as long as we behave only as independent, rational, free-enterprisers [1].

What do we know? Here I'm focused on the problem of dropping litter and waste disposal in a Jordanian city Al-Tafilah. The problem arises from low level of ecological culture and lack/weakness of institutions which might force to care about clean city. Jordan is the country with mostly private ownership of lands which are handed down. These lands are very clean and accurate because they have been cared about by private owners. The lands in state ownership, waste lands, as well as waysides, streets are polluted with different kinds of litter (packages, plastics bottles, paper, glass, etc.); even you might see dead cats or biological waste from slaughter sheep. So sanitarian conditions as well as the look are not

satisfying. Here is in Tafilah sewage disposal service but (1) the accuracy of it is rather weak, (2) the growth of litter is rather quick because seems nobody cares.

Why do we care? The city must be clean because it directly influences sanitarian conditions, health (in particular, when the climate is hot). It should be attractive for tourists who create the large source of income for the country. Additionally, as a proverb says: “Clean outside — clean inside” which relates to people’s inner culture, morality, consciousness.

But I guess it is a mistake to think that we can control people’s behavior in the long run by an appeal to conscience. Charles Galton Darwin made this point when he spoke on the centennial of the publication of his grandfather’s great book [2]. The argument is straightforward and Darwinian. People vary. And some people will undoubtedly respond to the appeal more than others, which is to stop dropping litter and in general reduce pollution by all available means.

As Garret Hardin wrote, the problem of pollution/waste arises from the open access to common resources when everybody cares only about one’s self-interest or careless at all. G. Hardin says that environmental problems are the consequence of population. I would kindly disagree with the prominent scientist. I think it is a consequence of low level of ecological culture, environmental consciousness, weak formal institutions, education on this matter as well. And I believe that strong formal institutions and education which strengthens informal institutions can solve the problem of waste, and in particular, dropping litter in Al-Tafilah city.

What can we do? Here I would like to comment proposition of G. Hardin to control the population and limit its growth [1]. Firstly, defining an optimum is enormously difficult. Ironically, what if just one human being would be left on the planet but the richest and the least environmentally threatening; by the way it is mathematical optimum. So I guess the problem isn’t in the amount. The problem is in people’s *creativity and moral responsibility*. Here I agree with the philosopher Ch. Frankel that “responsibility is the product of definite social arrangements” [3]. That is what we need in Al-Tafilah. Secondly, *human capital* is the greatest resource which we should learn how to use to tackle problems. Human genius is enormous and creative. Thirdly, what we should do is to *change our attitude to consumerism as a lifestyle, consumerism as a mean to satisfy our ego*.

I do agree with Tanya Singer about promoting *pro-social behavior* which should be incorporated in concrete policy proposals. Recent studies showed that humans can be motivated by pro-social preferences, like fairness and concern for others’ welfare or rights. T. Singer admits that it is time to replace the framework of *homo economicus* with a model that reflects human’s capacity for altruism and pro-social behavior. In fact, humans are often driven to help those in need, even complete strangers, by feelings of empathy and compassion. This idea is reinforced by a vast amount of neuroscientific evidence, which contradicts the emphasis on individualism that prevails in Western societies, suggesting instead that the human brain is

wired for affective resonance, with people naturally reflecting each other’s emotions and motivational states. Moreover, experimental data suggest that, contrary to mainstream economic theory, people’s preferences are changeable. Shifting environmental factors shape human decision-making by activating motivational systems related to threat, achievement, and power motivation, as well as to care for others and social affiliation [4].

Humans are capable of building sustainable, equitable and caring political systems, economies and societies. And we need *cooperation instead of competition*. And I should admit that the idea of cooperation is not some silly utopia which is emphasized by Yochai Benkler [5]. It is grounded on some of the best and most rigorous research in behavioral science.

Steps we can take to make a positive difference. So everything written above should lay in building new responsible and ethical way of thinking. For now, as a suggestion in economic terms, what we can do here in Al-Tafilah.

Firstly, we can create a **deposit-refund system for packaging**, namely to implement additional payments for such packages as glass and plastic bottles and tins that are got back when these packages are returned.

For example, waste re-processor pays out to a special point of utilized glass packages \$1 per 1 kg. In its turn the special point pays out to an individual 0.6\$ per 1 kg of packages. The difference of \$0.4 is an income of the special point.

Objectives:

- inducements for inhabitants accurately collect and return utilized packaging;
- strengthening on the market of reusable packages’ positions which cause less damage to the natural environment than disposable packages.

Scheme of realization and necessary conditions:

- implementation of Law on packaging;
- legislative limitations of packages’ diversity since the more packaging products diversify the more complicate to organize programs on its processing and recycling;
 - informing of inhabitants on necessity and advantages of collecting and returning utilized packages into special points;
 - creation of special points of utilized packaging materials, the holders of which should negotiate contracts with waste re-processors;
 - building of new or modernization of operating waste re-processors which receive packages for recycling and pay money to special points. Then packages are processed into second products which are then sold on the product market, and waste re-processors get incomes.

In case when it is turned out that a price of second products is higher than a price of primary products we can apply the following scheme for stimulation of economic agents to buy second products. We can impose a special waste tax on goods sellers and return it as a subsidy to a waste re-processor in order to make a price of second products lower than a price of primary products. Tax rate among other things will depend on

the difference between prices of second and primary products. For example, the difference in prices of second and primary products (glass) is \$10 per 1 kg, i. e. primary products are \$10 cheaper. Then a special waste tax rate per 1 kg of glass packages should be strictly higher than \$10. Let it be \$12. Then this \$12 are directed to the municipal budget and redistributed as a subsidy to a waste re-processor minus some part as administrative costs (let it be \$0.5). So a subsidy level is \$11.5. As a result a price of second products will be lower than a price of primary products by \$1.5, and economic agents will be more interested in buying second products made from glass. A waste re-processor will be profitable.

Results and benefits would be as follows:

- reducing of waste from consumption due to processing and recycling some sorts of packages, and, as a consequence, improving environmental situation in the region;
 - rising level of ecological culture of inhabitants with the help of financial incentives provided by the deposit-refund system;
 - stimulation of ecological business development;
 - increasing confidence of local government that supports environmental projects.

Secondly, we can organize **composting and biogasification of biological waste** in Al-Tafilah. The idea is to create a scheme of separate collection and centralized processing of biological waste with further production of manure and biogas. The initiator of the project could be the municipal association on waste management. Sources of biological waste are private households, restaurants, other sources.

Why this idea is necessary to implement into practice:

- hot Jordanian climate leads to the situation that biological waste pose a threat for people' health and local ecosystems;
- arid region and acute shortage of fertile soil lead to low crop capacity and impossibility to develop rural economy in some regions;
 - problems with waste management in general.

Technical details of the project are as follows. Biological waste is collected by state or private agencies that provide municipal services. Biological waste is transported by lorries to a special re-processor. This plant produces manure of a high

quality that is used for improving soil and also biogas that is used for motor vehicles (at least for lorries that transport waste).

What we should do:

- to inform inhabitants about advantages of the scheme of biological waste management and make a survey of public opinion;
- to organize an efficient and convenient scheme of biological waste collection;
- to acquire modern lorries for biological waste transportation by municipal or private agencies;
- to build or modernize a biological waste re-processor for manure and biogas production;
- to advertise in order to sell manure and biogas.

Financial sources and further support of the project:

- on the initial stage it is possible to use bank credits given out on principles of Islamic banking or attract private capitals;
- payments of households for collection and utilization of biological waste;
- penalties for non-compliance of ecological legislation;
- profits from manure and biogas selling, a part of which goes to a municipal budget as a profit tax and another part remains at the disposal of a plant that produces manure and biogas.

Project will result in:

- solving a problem of biological waste;
- improving fertility of local soil with respective positive effects for rural economy;
- stimulation of development of green business and ecological legislation;
- creation of new labor places;
- increasing the image of local government that supports environmental projects;
- improving ecological situation in Al-Tafilah region.

I would like to finish this article citing T. Singer: "Humans are capable of far more than selfishness and materialism" [4]. So local leaders should work to develop systems that encourage individuals to meet their full socio-emotional potentials and, thus, to build the city in which we all want to live.

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Tax integration in European countries: development and consequences

Abstract: conducted research is focused on a study of the process of tax integration in European countries. The main stages of tax cooperation and key achievements of tax collaboration are summarized. Investigation of the results of the tax integration allowed to confirm existence of permanent convergence of tax systems in Europe as the legislative and the practical level.

Keywords: tax cooperation, tax harmonization, European union, tax convergence

Intensification of globalization processes on the current stage of economic relationship development creates a basis for cross-country tax cooperation. Particularly relevant tax collaboration gets in Europe which ultimately leads to the tax laws harmonization and tax systems convergence. The necessity of tax cooperation in European country caused by objective conditions such as improvement of competitiveness of European economies in the confrontation other centers of the global economy, increasing the attractiveness of tax competition, especially for poorer countries, minimization of tax offenses and corruption schemes. Taking into consideration above arguments, investigation of tax cooperation development in Europe and its main consequences is relevant.

First of all is necessary to research the evolution of tax cooperation process in European country. In this context should pay attention to the research conducted by A. Pogorletskii. Author identified four stages of cross-country tax collaboration:

1 stage (second half of XIX century — 1913) — emerging of cross-country cooperation in the prevention of international double taxation of income and property. Development of conclusion of international tax treaties (the first agreement was signed in 1843 between France and Belgium).

2 stage (1919–1945) — creation of the Finance Committee of the League of Nations (1920), which proposed the own criteria of identification the place of taxation. Preparation of the first model tax convention.

3 stage (late 1940s — mid 1990s) — preparation of the OECD and the United Nations Model Tax Convention. The signing of the Multilateral tax agreement of the Council for

Mutual Economic Assistance. The beginning of the process of European tax coordination.

4 stage (late 1990s — nowadays) — starting of international coordination of taxation of e-commerce transactions. Interstate cooperation in opposition to destructive tax competition. Start of harmonization of direct taxes in the EU countries [6, 66].

Important step in the development of European tax integration is the creation the Intra-European Organisation of Tax Administrations (IOTA) in 1996 — an international organization that provides support and cooperation of tax administrations according to their individual needs. The full members of IOTA are tax authority of European countries. The tax services for non-European countries can become associated membership. For nowadays IOTA unites 46 full and associated members.

The main purpose of the IOTA is to encourage multilateral assistance, exchange of information and cooperation between members through a permanent forum for tax authority, training, organization of conferences, seminars, publications, technical assistance on the principles of transparency, innovation, professionalism and international position.

The results of IOTA activity on 2013 are 23 organized events that include 5 case study workshops, 13 workshops, 2 area group meetings and 3 forums. The main topics of these events are the development of e-tax administration strategy, increasing of tax audit efficiency, avoidance of tax evasion, reducing tax administration costs [4].

The latest achievement towards the development European tax collaboration is the agreement of a draft EU Direc-

tive about the automatic exchange of information between tax administrations by Economic and Financial Affairs Council in October 2014 [1]. This decision allows increasing the transparency of tax processes in international context and simplifying the work of tax authority in the area of disclosure of tax crimes, avoiding of double taxation and minimizing of tax evasion.

It should be mentioned that the consequences of tax integration can be considered in two directions: theoretical level — harmonization of tax law and tax systems and practical level — convergence of the tax rates and the structure of tax collections.

Harmonization of tax systems is the standardization and unification of tax law and tax strategy on the principles of consistency of regulation, synchronization of tax systems development, sequence of adaptation steps, and priority of international treaties over national legislation. The main objectives of tax harmonization are the limitation of the negative effects of tax competition and minimization the tax losses from national tax systems differences. S. Devko identifies the next directions of tax harmonization: harmonization principles of the tax systems; unification of tax systems structure, rapprochement of fundamental approaches and mechanisms of tax regulation; harmonization of concepts of direct and indirect taxation on the basis of general principles; using of common approaches to the organization of tax administration process [5].

It is worth noting that today necessity tax harmonization caused by not only integration policy European country, but also the development of new types of businesses (e-commerce, financial cooperation), efficient and transparent functioning of which requires uniform tax environment.

In a context of investigation the practical consequences of tax integration it should be noted that the measures of tax system approximation is sigma- and beta-convergence. Sigma-convergence involves the evaluation of dispersion of tax indicators between investigated countries. As a rule sigma-convergence based on the calculation of the coefficient of variation and analysis of its dynamic. Concept of beta-convergence focused on the evaluation of gaps between the current and the base level of tax indicators. The presence of beta-convergence shows that the jurisdiction of higher value of fiscal distances approaching to the average level of indicator faster than jurisdictions that have lower fiscal distances. Calculation of beta-

convergence can also define an annual pace of cross-country tax indicators approximation.

The studying of tax convergence in EU-15 in a period 1965–2010 carried out by F.J. Delgado based on analysis a fiscal distance of total tax burden and tax burden of selected tax group to average level in EU-15 [2]. Conducted calculations confirm the presence of the tax burden level convergence in the European Union in the period studied. Sigma-convergence assessment showed that the level of the overall tax burden was characterized by an annual pace of approximation of 0.73%; level of fiscal pressure on income and profits — 0,46%; level of tax burden on goods and services — 0,82%; level on social security contributions burden — 0,73%.

At the same time assessing beta-convergence allowed to confirm its existence for total tax burden, fiscal pressure on income and profits and goods and services, but for the social security contributions beta-convergence is not statistically significant. For the overall period annual rate of beta-convergence for total tax burden is fixed on the level 2,06%, for the income and profits — 2.11% and for the goods and services — 2.94%.

Taking into consideration the previous results of F.J. Delgado studying [3] can be noted that the European Union countries characterized by the convergence of the level and structure of tax revenue, which is more evident in the period 1965–2003 while as recently approached the level of tax indicators slower pace.

Conducted research allows to summarize that creating a single economic space in Europe requires the formation of a unified institutional and legal support, which acts as an important component of the tax environment. Intensification of tax integration processes allows achieving the following objectives: increasing transparency of the tax process, prevention of fiscal evasion and tax crime detection, avoidance of double taxation, eliminating the adverse effects of tax competition. The outcomes of the tax integration are an increasing of national competitiveness, improving conditions for economic cooperation, enhance the efficiency of tax administration functioning. Investigation the process and the results of tax cooperation in European country suggests permanence of partnerships and approximation of national tax systems that create the conditions for further cooperation and receipt of a positive economic effect.

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Sustainable security of social and labor relations of a town-forming enterprise of a monoprofile municipality

Abstract: In this paper the authors prove the actuality of the analysis of social and labor relations in monoprofile municipalities today. The specific features of social and labor relations at a town-forming enterprise of a monoprofile municipality are displayed. The concepts of “sustainable development of social and labor relations” and “sustainable security of social and labor relations” of a town-forming enterprise of a monoprofile municipality are developed. The authors proposed a methodological approach to the evaluation of sustainable security of social and labor relations of a town-forming enterprise of a monoprofile municipality.

Keywords: social and labor relations, town-forming enterprise, monoprofile municipality, sustainable security

1. Introduction

Social and labor relations are the key component of the entire system of relations of the society. They define the people's way of life, the structure of the related processes and relationships, the level of their well-being. The level of the development of social and labor relations characterizes the social orientation of the economic system, the perfection of social relations as a whole. However, the careful attention should be paid to the study of the specifics of social and labor relations at the town-forming enterprises are, as they are the special object of the regional economy. The town-forming enterprise acts as the company which employs a large proportion of the municipality population.

It is also a budget-forming company because the local budget is based on the income of the population, the main source of which is wages set by the town-forming enterprise. The town-forming enterprise proves to be the socio-forming, because it is the source of a variety of social benefits for the population and generates the unique subculture of the city related to the activities of this enterprise. In addition, the city-forming enterprise becomes the image-forming for the monoprofile municipality, because the prestige of the occupations related to it depends on its status and privileged position [1; 2].

The effect of the town-forming enterprises and the monoprofile municipalities on the Russian economy can be illustrated by statistics. Thus, according to the data of 01.10.2013, over 16 million people, which is more than 11% of the total popu-

lation of Russia, live in 467 monoprofile municipalities and produce about 21% of the country's GDP [3]. In the foreign countries, in which there are also the monoprofile municipalities, the considerable experience in their management is gained.

In the crisis conditions the town-forming enterprise appeared to be less stable in comparison to the companies of the multi-industry economy cities. Currently, the Group for the modernization of the monoprofile municipalities is established under the governmental commission for the economic development and integration, which divided all monoprofile municipalities of Russia (the number of which was reduced to 342) according to «the traffic lights» mode. Depending on the socio-economic status the three zones were marked as follows: the «red» zone — a bad situation, or a tendency to worsen (92 monoprofile municipalities); the «yellow» zone — the situation is stable but may deteriorate at any time (150 monoprofile municipalities); the «green» zone — the situation is stable (100 monoprofile municipalities) [6]. In the monoprofile municipalities the constant monitoring to detect the emerging threats and negative tendencies, above all, in the social and labor sphere, is required in order to prevent its transition from the «yellow» and «green» zones to the «red» one, and reduce their overall level of socio-economic well-being.

The formation of the socio-economic well-being of the monoprofile municipality and its population is inextricably linked to the sustainability of social and labor relations of the

town-forming enterprise of the monopile area. [7] However, in the domestic and foreign literature the researches on comprehensive and integrated analysis of social and labor relations of the monopile municipalities are underrepresented. All existing methods [8, 9, 10–13, 14–16] are devoted to the general analysis of the socio-economic situation of the municipal municipalities. The analysis of social and labor relations in the techniques is carried out only on the basis of the individual performance. At the same time it is important to assess comprehensively the state of labor relations in the monopile municipality. Thus, the relevance of this research and the need for further analysis led to the choice of the research topic.

2. Features of social and labor relations in the monopile municipality

The purpose of this paper is to develop methodological approaches for the assessment of sustainable security of social

and labor relations of a town-forming enterprise of a monopile municipality.

The object of study is the sphere of social and labor relations of a town-forming enterprise of a monopile municipality.

The subject of the study is the factors and the methods to ensure sustainable security of social and labor relations of a town-forming enterprise of a monopile municipality.

The sphere of social and labor relations of monopile municipalities has specific features compared to municipalities with a diversified economic structure (Table 1). This issue is discussed more detailed in the publication of the authors [17]. Therefore it is necessary to provide the monopile municipality not only by the safety of social and labor relations, but also their long-term safety, carrying out the continuous monitoring.

Table 1. – The specifics of social and labor relations of a monopile municipality

Subsystem	The specifics of social and labor relations of a monopile municipality
Social subsystem (social and labor aspect)	<ol style="list-style-type: none"> 1) the low level of diversification in the labor market (because a large proportion of the population of a monopile municipality is employed by a town-forming enterprise); 2) a town-forming enterprise has a significant impact on the price of labor in the labor market of a monopile municipality; 3) the dependence of a monopile municipality infrastructure (municipal facilities, power, social services) from a town-forming enterprise; 4) the limited labor mobility; 5) the closed structure of labor market with the limited resources for the development of labor potential; 6) the low entrepreneurial activity of the population (a low level of development of small and medium-sized businesses).
Technological subsystem (social and production aspect)	<ol style="list-style-type: none"> 1) the dependence of health of the most monopile municipality population on the conditions of occupational safety at a city-forming enterprise; 2) a city-forming enterprise determines the level of qualification of a large part of the population; 3) the dependence of a monopile municipality on a city-forming enterprise in terms of the environmental load; 4) the impact of the investment policy of a city-forming enterprise on the level of modernization of the manufacturing base in a monopile municipality.
Institutional subsystem (organizational and economic aspect)	<ol style="list-style-type: none"> 1) the social responsibility of a city-forming enterprise is an essential element of effective labor market of a monopile municipality; 2) the lack of social partnership, as there is no association of employers; 3) the dependence of a monopile municipality budget revenues on the efficient operation and management of a city-forming enterprise.

3. Sustainable security of social and labor relations in the monopile municipality as the basis of social and economic well-being

The sustainable security of social and labor relations can be considered:

1. As the process of sustainable development with its components, i. e., the set of conditions and factors that contributes to the dynamic sustainable development.

2. As a result, as an indicator of sustainable development of social and labor relations of a monopile mu-

nicipality that is it can have different levels: high, medium, minimum.

Social and labor sphere in a monopile municipality, on the one hand, is the factor of sustainable security, ensuring the social stability, the labor potential formation, the factor of constant economic growth. On the other hand, the social and labor sphere is an object of sustainable security.

The structure for the provision of sustained security of social and labor relations of a monopile municipality is shown in Figure 1.

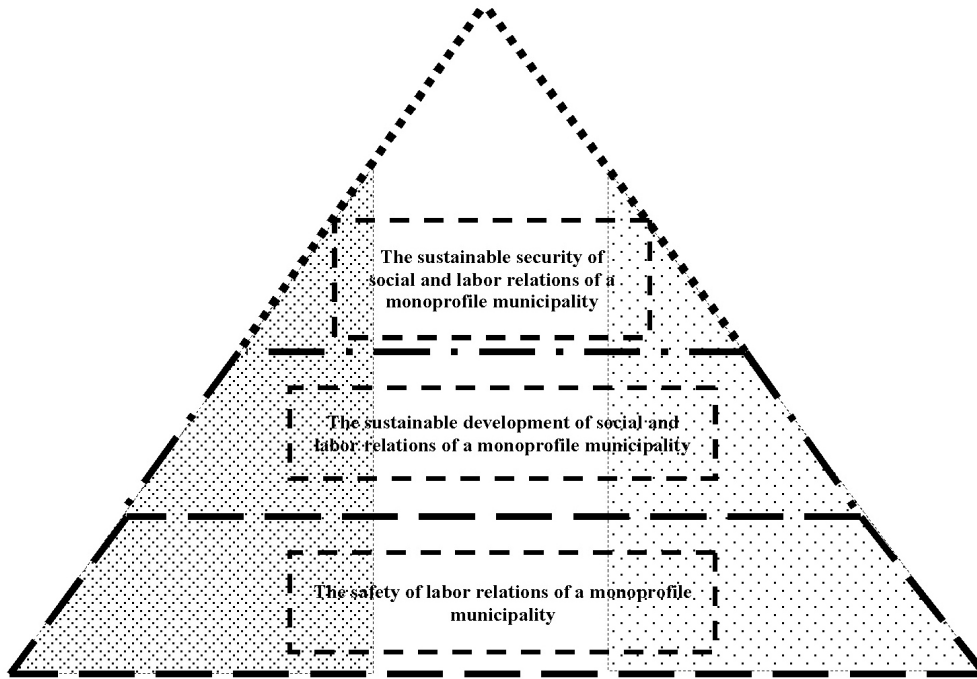








Fig. 1. The provision of sustainable security of social and labor relations of a monoprofile municipality

Keys:

-  — Technological subsystem (social and production aspect)
-  — Social subsystem (social and labor aspect)
-  — Institutional subsystem (organizational and economic aspect)
-  — Security of a monoprofile municipality
-  — Sustainable development of a monoprofile municipality
-  — Sustainable security of a monoprofile municipality

The proposed categories can be summarized as follows.

The safety of labor relations of a monoprofile municipality — is the balance of interests of social and labor relations of a city-forming enterprise, which is the system-forming element of the labor market of a monoprofile municipality.

The sustainable development of social and labor relations of a monoprofile municipality — is the development of social and labor relations, focused on the preservation and development of human beings as the multifaceted creature for the functioning and development of a city-forming enterprise and a monoprofile municipality in the long perspective.

The sustainable security of social and labor relations of a monoprofile municipality — is the set of conditions and factors that contribute to the development of human beings as a multifaceted creature through security and sustainable development of the sphere of social and labor relations on the basis of social responsibility and social partnership.

To prevent the loss of a monoprofile area sustainable security it is important to know the threats that may arise in the field of social and labor relations when the crisis occurs, the deterioration of the financial and economic condition of the city-forming enterprise, the impact of the monopsony labor market (Table 2).

Table 2. The threats for the sustainable security in the sphere of social and labor relations

Subsystem	The threats for sustainable security in the sphere of social and labor relations
Social subsystem	<ol style="list-style-type: none"> 1. The threats associated with the monopsonic type of labor market (understatement of the level of wages, the inability to fully meet the basic human needs). 2. The threats of the population solvency (decrease of the population income, reduction of the level of charges for services, operating problems of small businesses due to lower demand for services, tax revenue reduction). 3. The threats of reduction of quality of life due to the unstable operation of the city-forming industry (availability reduction of social infrastructure services, deterioration of the social security system, etc.). 4. The threats associated with the disengagement or long vacations because of the decline in the production of goods and services of the city-forming enterprise: <ul style="list-style-type: none"> • the unemployment increase, • the emergence of social tensions, adverse social and psychological environment, • the loss of qualification and professional activity skills,

	<ul style="list-style-type: none"> • the emergence of social and labor conflicts, • the decline in the quality of labor and scientific and industrial potential of society and its ability to develop
Technological subsystem	<ol style="list-style-type: none"> 1. The threats of the labor force migration (the low level and quality of the proposals on the labor market of the monoprofile municipality, personnel instability, the reduction of the attractiveness and potential of the monoprofile areas). 2. The threats in the sphere of occupational safety and health: <ul style="list-style-type: none"> • poor labor conditions that cause occupational diseases, • poor quality of individual and collective protection, • the use of equipment that does not meet safety requirements, which may lead to the increase in occupational injuries, • the decline in the quality of labor through deskilling and the health loss of the workers, 3. The professional and qualification threats: <ul style="list-style-type: none"> • the inadequate professional qualification of workers, • the lack of demand for labor, possessing the necessary qualifications in the labor market of a monoprofile municipality, 4. The threats associated with increased environmental pressure on the population of a monoprofile municipality (the excess of the emission limits by the city-forming enterprise).
Institutional subsystem	<ol style="list-style-type: none"> 1. The threats associated with the lack of social partnership development, as in the monoprofile municipality there are no associations of employers and the labor market has a great influence on the city-forming enterprise. 2. The threats associated with the low levels of social support and small business. 3. The threats associated with the low level of social responsibility of a city-forming enterprise and other economic entities of a monoprofile municipality, especially in the period of market volatility (the reduction of various social programs and the rejection of social objects). 4. The threats associated with the low financial stability, inefficient allocation of resources and management of the city-forming enterprise.

4. Method of determining of the sustainable security of social and labor relations monoprofile municipality

For the timely prevention of threats to the sustainable security of social and labor relations the monoprofile municipality requires an effective monitoring system, based on the methodologies for the assessment of sustainable security of social and labor relations of a city-forming enterprise of a monoprofile municipality proposed by the authors (hereinafter — methodology).

This technique allows to:

1. To carry out the rapid diagnosis of the sustainable security of social and labor relations on the basis of key performance indicators.

2. To identify the “pain” subsystems and elements of problem areas requiring priority attention.

3. To conduct a detailed analysis of the “pain” subsystems and elements of problem areas.

4. To monitor and forecast the sustainable security of social-labor relations of a city-forming enterprises and a monoprofile municipalities.

5. To carries out inspections of strategic documents of a monoprofile municipality for the purpose to reveal their compliance with the basic criteria of sustainable security of social and labor relations.

6. To assess the availability of internal resources to enhance the sustainable security of social and labor relations.

The Methodology is designed to track the degree of complementarity of the sphere of social and labor relations

of a city-forming enterprise and the sphere of social and labor relations of a monoprofile municipality. It is achieved by evaluation of performance indicators both at the level of a city-forming enterprise, and at the level of a monoprofile municipality.

The proposed methodology also permits to assess the level of sustainable security both in general and of each of the blocks separately (security, sustainable development and sustainable security). This is important since a favorable situation in one block, as compared with others, may distort the situation outlook. As for the troubled block, it is necessary to consider thoroughly all subsystems (social, technological and institutional). Only such «point» response will allow us to solve the emerging problems, to determine the need for verification of documents and specific directions of social and economic policy.

The Methodology consists of the following blocks:

1. Methodological block that contains information about the baseline information collection methods, forecasting, target calculation.

2. Analytical block, which includes the formation of the monoprofile municipality “portrait”, as well as groups of indicators with the help of which the sustainable security level is assessed. The methodology is based at the same time on the principle of universality and the principle of uniqueness. This is achieved through the following subsections:

- 1.1. The general analysis of the socio-economic condition of the monoprofile municipality (indicators of socio-econom-

ic condition and indicators of sustainable development, as well as supplementary indicators that reflect the monoprofile municipality specifics).

1.2. The rapid diagnosis (key performance indicators, which determine by the overall level of sustainable security of social and labor relations).

1.3. A detailed analysis, which involves the detailed assessment of each individual direction.

3. Forecast block. It provides for the prediction abilities taking into account the particular monoprofile municipality specifics. It allows analyzing the consistency of the socio-economic development trends of a monoprofile municipality and strategic documents in the area.

4. Target analysis. Verification of strategic documents the monoprofile municipality with the purpose to reveal their compliance with the basic criteria of sustainable security of social and labor relations.

On the basis of the evaluation and calculation of the indicators the level of sustainable security is determined to develop the necessary management decisions:

1) High/normal level of sustainable security. It is characterized by the optimal values of all indicators evidencing the economy diversification of a monoprofile municipality, the reduction of its dependence on a city-forming enterprise. The adjustments for the strategic documents are not required.

The monoprofile municipality management is carried out according to the pre-established procedures and time-frames.

2) The condition with signs of instability. The significant deterioration in several important areas is observed. This stage is also characterized by negative development trends (dynamics) that threaten the sustainable development. The adjustments of some strategic documents are required.

3) The unstable condition. It is characterized by an overall significant deterioration of the indicators in the most subsystems of social and labor relations of a monoprofile municipality. It leads to the disruption of the interaction of the basic parameters of the system. With further negative developments there is a loss of its control. The review of all major strategic policy directions is required.

More detailed information on the methodology can be found in publications [18; 19–21].

5. Conclusion

Thus, the Methodology for the evaluation of sustainable security of social and labor relations the city-forming enterprise of a monoprofile municipality will make it possible not only to monitor their current condition, but also to solve the arising problems, identify ways to ensure sustainable security in the field of social and labor relations, to relate the current operation results to the strategic documents and, if necessary, to make timely adjustments.

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Stepwise determination of damage from realization of security hazards of a company

Abstract: We proposed an original algorithm for the assessment of damage from the implementation of security threats to enterprise-oriented step-by-step clarification of values to the evaluation of the characteristics of the distribution. The feature of the proposed algorithm is to use simulation to obtain the generalized expert assessment of the likely range of values of the damage. The collective opinion of experts about the value of damage is determined as the average of random variables having the uniform or triangular distribution

Keywords: Damage assessment, simulation, statistical characteristics of the distribution

Task description. It is known that the efficiency of activity of the subjects of market economy largely depends on how well the security of a company is ensured. At the same time, as a rule, one fails to accurately assess the possible damage from realization of hazards on the basis of retrospective analysis. Expert methods are used more often for these purposes. Herewith, it is desirable to maximally stimulate the active intellectual activity of the participants of the expert group in the process of expertise; exclude the impact of personal qualities of the participant on the results of the expertise and appropriately generalize the opinions of all members of the expert group. An original algorithm oriented to stepwise determination of damage values with simultaneous assessment of distribution characteristics (SDV-SDC) is proposed below.

Peculiarities of the algorithm. The distinction of the proposed approach towards the assessment of possible damage from realization of security hazards of a company lies in, firstly, the usage of multi-step procedure, at every step of which there is simulation modelling, and, secondly, the integration of the Delphi method (developed by O. Helmer, N. Dalkey, T.J. Gordon to forecast the future) with expertise aimed at obtaining a generalized opinion of the expert group about the possible range of values of the unknown indicator. Such combination provides a range of advantages; particularly, it gives the specialists participating in the expertise an opportunity to view objections and propositions of other members of the expert group in the environment free from the impact of personal qualities of the participant. Concurrently, there is an opportunity to use so called «informed instinctive judgment» of a specialist expert by way of creating such conditions, when the expert can actively interact with other specialists in this sphere or spheres related to other aspects of the studied problem. Herewith, direct communication of the specialists with each other is replaced with the sequence of steps, at each of which the full expertise cycle is realized [1; 2].

Remark. It is suggested that there is stepwise ranking of possible security hazards of the company with the use of

median and Kemeny distance during the processing of the expertise results at the initial stage.

Let's assume that the described integration with the Delphi method is realized. But, there is a question: how to define that the collective opinion has stabilized and it's time to end further polls?

What is the possibility, for instance, that the certain value of the unknown indicator will not be exceeded?

What is the possibility that the value of the indicator will be within set confidence boundaries? The list of similar question may continue.

To answer the questions, apparently, the only reasonable procedure is the sequence of steps proposed below:

1. The assessments of every i expert at j step $E^{(j)}_i$ are approximated by uniform distribution (if the expert pointed out two values of the damage — minimal and maxima) or triangular distribution (if three values of the possible damage value are pointed out — minimal, maximal and most probable).

2. Generalized collective opinion of n experts about the unknown indicator of damage is defined as mean n of random values having uniform or triangular distribution [3; 4].

Products allowing building simulation model with minimal labor inputs (in automated mode) can be used as instrumental means for realization of simulation modelling.

For example, a program system of the automated synthesis of simulation models on the basis of the language UML (SIM-UML) is designed to build simulation models in the sphere of economics and management [5; 6], including the simulation models of business processes realized at enterprises and organizations.

The system is developed within the concept of integration of the visual and simulation modelling of business processes and realizes the respective method, meta-model and a set of algorithms.

SIM-UML system allows:

— keeping a list of variables, setting qualitative characteristics of the model;

— building UML-models with the help of graphic constructor that determine structural and behavioral characteristics of the process;

— forming a program code of the simulation model automatically.

Variables and UML-diagrams are created during the building of the model. Main parameters are set for the variables, which allow the performance of obtaining (generation or calculation) of the respective numerical value. Numerical parameters are also set for the elements of UML-diagrams in accordance with the accepted meta-model (the usage of variable models in the elements of UML-diagrams enables to take into account the stochastic nature of modeled business processes).

3. As a result of the simulation modelling at each k step, one obtains statistical characteristics (*mathematical expectation, dispersion, variation coefficient, excess, asymmetry*) and **distribution** (table and histogram) of the values of damage from hazard realization in the system of information security of the enterprise.

4. After each step (expertise cycle), the participants of the expert group get acquainted with explanations presented in defense of very different assessments of damage and informed about a possibility to change their previous answers.

5. At each j step, *the change* of values of variation coefficient $K_{var}^{(j)}$ of the function $E_{gen}^{(j)}$. In case of deviation of the variation coefficient from the previous value, for instance, by 5% and less, once can assume that the assessments of the experts stabilized and it is reasonable to end the expertise, i. e. if

$|K_{var}^{(j)} - K_{var}^{(j+1)}| * 100 / K_{var}^{(j)} < 5\%$, the expertise can be ended.

6. On the basis of simulation modelling, the confidence boundaries of damage values and the possibility of whether its values will be bigger or smaller of a certain number are assessed at the last step.

Example. The group of 9 experts will assess the damage value (nominal units) during the realization of a *concrete hazard* of the security of the enterprise. The results of four steps (four cycles) of the expertise are presented in Table 1.

Table 1. – Results of four steps (cycles) of the expertise

Expert	STEP 1			STEP 2			STEP 3			STEP 4		
	Min	Opt	Max	Min	Opt	Max	Min	Opt	Max	Min	Opt	Max
E ₁	3	5	9	5	6	9	6	7	9	6	7	9
E ₂	30	33	65	15	20	30	15	20	30	15	20	30
E ₃	2	5	9	4	5	8	4	5	8	4	5	8
E ₄	8	11	15	8	11	15	8	11	15	8	11	15
E ₅	3	5	8	3	5	8	3	5	8	3	5	8
E ₆	14	17	22	14	17	22	14	17	22	12	14	20
E ₇	11	15	19	11	15	18	11	15	18	11	15	18
E ₈	20	25	55	15	20	35	10	12	22	10	12	21
E ₉	12	15	35	10	15	25	8	11	15	8	11	15

*Bold numbers are the values of time changed by the expert at a subsequent step.

Below, there are the results of simulation modelling after each of four steps of the expertise.

Table 2. – The results of modelling at steps 1–4

Parameter	STEP 1	STEP 2	STEP 3	STEP 4
Variable	E ⁽⁰¹⁾	E ⁽⁰²⁾	E ⁽⁰³⁾	E ⁽⁰⁴⁾
Iteration number	1000	1000	1000	1000
Mean	17.51	13.7	12.24	11.98
Dispersion	2.02	0.61	0.37	0.36
Mean square deviation	1.42	0.78	0.6	0.6
Variation coefficient, $K_{var}^{(01)}$	0.08	0.057	0.049	0.05
Asymmetry	0.3	0.08	0.08	0.15
Excess	-0.22	-0.12	-0.24	-0.35
Minimum	14.2	11.4	10.36	10.38
Maximum	22.4	15.88	14.15	13.85
Modal interval	17.18: 17.93	13.44: 13.84	12.08: 12.43	11.64: 11.95

Let's assess the appropriateness of completion of the expertise, i. e. define the significance of change of the variation coefficient at subsequent step. To do so, let's calculate the value

$|K_{var}^{(03)} - K_{var}^{(04)}| * 100 / K_{var}^{(03)} = 2,08\% < 5\%$, i. e. the expertise can be completed. Now, having applied the data of the table 3, one can define the possibilities that the values of demand will be within the set range.

Table 3. – Values of accumulated possibility at the 1st and 4th steps

X_{\min}		X_{\max}		The possibility of the function $E^{(1,4)}$ falling within the set range of values		Accumulated possibility	
STEP 1	STEP 4	STEP 1	STEP 4	STEP 1	STEP 4	STEP 1	STEP 4
14.20	10.38	14.94	10.69	0.025	0.007	0.025	0.007
14.94	10.69	15.69	11.01	0.066	0.041	0.09	0.048
15.69	11.01	16.44	11.32	0.149	0.090	0.24	0.14
16.44	11.32	17.18	11.64	0.188	0.167	0.43	0.31
17.18	11.64	17.93	11.95	0.204	0.197	0.63	0.5
17.93	11.95	18.67	12.27	0.148	0.181	0.78	0.68
18.67	12.27	19.42	12.59	0.121	0.152	0.9	0.84
19.42	12.59	20.16	12.90	0.062	0.102	0.96	0.94
20.16	12.90	20.91	13.22	0.028	0.039	0.99	0.98
20.91	13.22	21.65	13.53	0.005	0.019	0.996	0.995
21.65	13.53	22.40	13.85	0.004	0.005	1.000	1.000

Conclusions.

1. An original algorithm of assessment of damage from realization of security hazards of an enterprise oriented to *stepwise determination of values with the assessment of distribution characteristics* (SDV-SDC) is proposed. **One** of the peculiarities of the proposed algorithm lies in the usage of simulation modelling to obtain generalized expert assessment of the range of presupposed values of damage; **the second one** lies in integration of the Delphi procedure, which is usually used to forecast the future with *an expertise aimed at obtaining the concrete values of damage*. Generalized collective opinion of

n experts about the value of damage is defined as mean *n* of random values having uniform or triangular distribution by way of realization of the simulation modelling. The assessment of statistical characteristics (*mathematical expectation, dispersion, variation coefficient, excess, asymmetry*) and distribution (in the form of tables and diagrams) of values of damage are obtained as a result of simulation modelling.

2. Automated synthesis of the simulation models in the process of the proposed algorithm enables to repeatedly reduce the labor inputs with regard to obtaining the assessments of damage value.

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Section 14. Science of law

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The concept of fetus's extrusion in writings of the Russian Empire jurists (the end of XIX — beginning of XX centuries)

Abstract: The article considers different views on the concept of “fetus's extrusion” developed by Russian researchers of the Russian Empire in absolutism and transfer to a bourgeois monarchy periods.

Keywords: fetus, extrusion of fetus, criminal abortion, feticide, crime.

Formation and development of the legal category “extrusion of fetus” in the Russian law has its own history. According to the legislation of the Russian Empire, extrusion of fetus was recognized as a crime and illegal, conscious, based on volition feticide.

Historiography practically has no special research on legislation regulating extrusion of fetus and feticide in the Russian Empire, however, certain aspects were still subjected to a comprehensive analysis. This was due to changes in legislation, the adoption of new legislation and historical events taking place.

In the historiography of XIX — early XX centuries a special attention should be paid to the works of the following authors: N. S. Tagantsev, V. D. Nabokov. Much prominence to the problem is given by I. V. Platonov in “The object of crime in the extrusion of the fetus” and by A. A. Ginzburg “Extrusion of the fetus”.

Individual aspects of extrusion of fetus were considered in writings by L. S. Belogrits-Kotlyarevskiy “A short course of criminal law”, M. N. Gernet “Women's equality and the criminal law”, A. S. Ignatovskii “Forensic Science”, N. Rosina “Lectures on criminal law” and others.

According to the opinion expressed by the lawyer N. S. Tagantsev, extrusion of fetus is a murder of an unborn child in utero, whatever the period of its development can be [7, 267]. On the other hand, pondering over the extrusion of fetus at different stages of pregnancy, N. S. Tagantsev concludes that the crime can not be considered as completed if the fetus had been under destruction, but the extrusion did not follow, and he remained in the uterus and disappeared into the amniotic fluid. At the same time N. S. Tagantsev comes to the conclusion that this crime will be considered as completed as soon as the fact of extrusion takes place even if the extruded fetus remains safe and will continue to exist [7, 303].

I. V. Platonov offers to regard the extrusion of fetus not as a crime but as a misdemeanor, arguing this point of view as follows: “No matter how important social objectives being pursued by punishment for extrusion of fetus are, but the

punishment should neither for pregnant women, nor, consequently, for their accomplices be particularly severe; committing the act of fetus's extrusion the mother is not completely aware of the viciousness and of the profound demoralization which so vividly accompany other serious crimes; and motives of pregnant women committing the crime are rarely particularly vicious by themselves” [5, 167]. He also states that the fetus can not be regarded as a crime against the health of the pregnant woman. “This opinion is denied by most of the criminologists, because in this case a pregnant woman would be conceded unpunished since damnification to personal health is not punishable. In cases of petty injures to health of a pregnant woman, according to the principles adopted for instance by our law, even her accomplices would avoid punishment if the victim (the pregnant woman) could forgive them or the damnifications had been done with her agreement. Consequently, the extrusion of fetus can be declared as the crime as long as completely innocuous for the health of a pregnant woman methods will not be invented [5, 156]”. Classification of extrusion of fetus as a crime against life, as a murder, even as a special kind of it and as a crime against property was also considered by I. V. Platonov as unacceptable. Therefore, he believed it more correct to assign extrusion of fetus and feticide to the category of crimes against the interests of the pregnant woman or the father of the expected child.

The conception of “abortion” was formed in the Russian Empire by the end of XIX — beginning of XX centuries. According to the Encyclopedia by Brockhaus and Efron of 1892, “abortion” was defined as an early, premature termination of pregnancy and extrusion of the fetus not capable of independent life apart from the mother's body, i.e. during the first 28 weeks of pregnancy. The same Encyclopedia says about “abortion produced intentionally” not only by a pregnant woman for the purpose of destruction of the fetus, but also by a doctor to save the woman's life [9, 510].

At the beginning of the XX century researchers divided abortion into two types: medical and criminal ones. In V. Dal's dictionary of 1903, one can find at least two definitions: “Abor-

tion is a medical termination of pregnancy. Miscarriage is a prematurely born child, infant and baby in general which is born so early that is unable to live by itself" [8, 4].

A. S. Ignatovskii formulated the following notion of a "criminal abortion": "the criminal abortion is an artificial extrusion of fetus made without any intention to save the pregnant woman's life and without any medical necessity and it is punishable and prosecuted by the law among the civilized nations, i.e it is considered as a crime" [3, 341].

A. S. Ignatovskii stated that "extrusion of fetus" and "feticide" were two categories possessing different meanings. The words "extrusion of fetus" do not exactly reflect the situation as the term must imply not only extrusion of the fetus but the destruction, feticide of it as well which clearly follows from the rules of Medical Regulations article 1738. Under the "extermination of fetus" the lawgiver implies the feticide in utero, under the "extrusion of fetus" is understood premature separation from the utero, false childbirth, stillborn fetus [3, 261].

V. D. Nabokov analyzing the regulations of the Code of criminal and correctional punishments also put different senses into these two categories: "Extrusion of fetus (not feticide) was contemplated in article 1461 (committed not by the pregnant woman herself but without her awareness or consent; the penalty had different degrees depending on the fact whether the extrusion of fetus resulted in pregnant woman's personal injury or even death or not: hard labor in a place of exile from 4 to 10 years), article 1462 (committed by someone with awareness and consent of a pregnant woman or by a pregnant woman herself), article 1463 (committed by a

doctor, an accoucher, midwife or "when it was adjudged that the defendant had already been guilty of this crime") [4; 3].

N. N. Rosin attributed feticide to the crime of privilege or to the murder with the punishment less severe than for other homicides [6, 569]. L. S. Belogritys — Kotlyarevskiy among murders of privilege singled out such as: infanticide, concealing of an illegitimate child's dead body, murder of an ugly infant, etching away of a fetus, murder as a result of self-defense exceeding [1, 154].

The beginning of the XX century was connected with fundamental changes in perception among scientists of extrusion of fetus as a crime. They defended the view not about maintaining of current legislative regulations but about their radical changes, restriction of the concept "punishable extrusion of fetus" or about the complete exclusion of this deed from crimes. The latter point of view was developed by M. N. Gernet in his report to the Congress of the Russian group of the International Union of criminologists.

Summary of the report upheld by Professors V. D. Pletnev, N. N. Polyansky and some others, found its strong encouragement in the speech presented by two women: a female doctor and a female lawyer. It was adopted by the majority of members of the assembly [2, 42–43].

In conclusion, it should be stated that extrusion of fetus during the period under study was regarded as a criminal act, but the question of classifying of this act to a particular type of crime was rather controversial and doubtful. At the beginning of the XX century much attention was paid by the lawyers to a non-criminal nature of extrusion of fetus.

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Categories «differentiation» and «integration» in modern legal science

Abstract: The article considers general scientific and methodological basics of the research of categories «differentiation» and «integration» in the conceptual framework of legal science. Special attention is paid to the feasibility of the need of perception of «differentiation» and «integration» as a categorical pair.

Keywords: differentiation of law, integration of law, legal system, legal categories, methodology of law.

In modern legal science the tendency of managing the notions and categories expressing these or those ties and relations in the legal reality is strengthening. They include the notions of management, organization, system, mechanism, structure, tie, relation etc. [2, 44]. It should be highlighted that to reflect such phenomena and social processes as functions, good organization and systematic nature in theory, substrate notions exclusively creating the picture of «morphology» of an object and its composition do not fit methodologically. The analysis of the simplest interactions in the legal sphere of the society shows the need for another conceptual framework; and when the study of systematic legal objects becomes the object of learning, then, it becomes possible to reflect their structure, dynamic of development and functioning in theory through combination of appropriate scientific means.

Such general scientific means should include the categorical pair «integration — differentiation». Let's agree with I. V. Blaumberg and E. G. Yudin that «objects of the modern scientific learning require not just an extension of existing conceptual framework, but a new categorical structure, a new system of notions» [2, 44]. However, since the need for such system exists in legal studies, then, undoubtedly, it finds its partial satisfaction. New notions in legal studies are aimed at solving tasks of a qualitatively new type neighboring the conventional categorical framework in science.

When studying the systematic nature of legal norms, one should take into consideration that such quality is given to them by functional «labor division» between them, their functional specialization. This quality presupposes not so much the reference of the norms to different parts of law as their relation with other norms of a respective institution, norms of other institutions and branches of law and their interaction in the process of regulation of social relations [8, 50]. This provision certifies about dialectic connection of the processes of differentiation and integration of legal matter. Differentiating functionally, legal norms create a base for their future integration within the institutions and branches of law as well as ensure inter-branch integration.

The specified initial methodological orientations enable to state that one of the most important moments in the study of the processes of differentiation and integration in law is their analysis at different «stages», levels of law system structure.

Such formally logical way as classification traditionally used in general theoretical description of legal phenomena does not solve a research task on level analysis of legal system. The study of systematic parameters of complex objects does not require the consideration of all possible variants and criteria for classification, be it the systems themselves, their structural elements or processes taking place in them. In similar situations, one should apply a special type of classification — a typology, which is performed according to a more substantial parameter revealing the deep processes of a reflected phenomenon. When studying the legal system, it is required to identify the types of the processes of differentiation and integration in law and, respectively, analyze them at different levels — at initial (elementary) level, institutional and branch-specific ones. Simple classification of types of differentiation and integration in law, despite the possibility to distinguish a considerable number of its criteria, does not allow taking into account the structural complexity of law as well as dialectics of internal and external factors determining the considered processes.

Determination of system-integrating and system-differentiating factors, their correlations and interrelations, is the most important methodological task of the structural analysis of a complex system and is a necessary condition of not just a descriptive reflection, but a constructive, explanatory study of the legal system in the form of its essential analysis and forecast of development ultimately related with modernization of legislation and improvement of law enforcement practice. «Establishment of factors forming and destroying the system is a primary point of the systematic analysis, — V.A. Ganzen reckoned. — The next step lies in definition of functions and structures... after which states and processes, properties and behavior of the system are studied» [3, 161].

Today, we can acknowledge that the categories of «differentiation» and «integration» in the methodology of science are given a special place in general theoretical description of the system of modern society. Positive experience of managing the specified notions accumulated by the methodology of science should find its use in legal studies, particularly, in the researches of the legal system. Nevertheless, it would seem that legal science should not uncritically borrow ready general scientific knowledge and it has no right to «dress» already known theoretical legal provisions about legal system into

«new» methodological «forms». The categories «differentiation» and «integration» used in the general theory of systems and the humanities should receive their appropriate deflection in legal studies with consideration of the specific of state legal sphere of life of the society. A fairly concrete new knowledge about the structure of legal system and processes taking place in it should be obtained, and new regularities of distinguishing structural formations, elements in law should be revealed through implementation of new constructions in the conceptual frames of the general theory of law.

The more detailed comparison is performed on systematic formations, the more differences will be between them. Dissimilarity of elements of the legal system is determined by inhomogeneity of internal and external environment. External environment is understood in this case as the system of social relations, which didn't only once gave birth to the need for law as a special regulation tool, but continues having a determining influence on it throughout its all history. The very diversity of existing social relations and ties is one of the driving reasons of differentiation of norms, institutions, branches and other structural communities in law.

Due to appropriate level of the processes of differentiation and integration in the legal system, it is possible to ensure such important properties and parameters as regulatory ability; resistance to external changing effects (adaptation flexibility) and capability of development. «A high level of diversity of structural components of the system, and abundance of degrees of freedom in many elements of it determine flexibility, mobility, adaptability, recoverability and, consequently, sustainability... Structural diversity is a reserve of life; it creates channels of correction of the kinds, ways for retreat, i. e. it performs a function of accumulation of exits from extreme situations» [7, 120].

A part of the legal system that changes at a certain stage of development, with time, differs more and more from other parts, which are more stable at the moment. The increase of discrepancy between separate structural elements of law means either the beginning of a new cycle of the process of differentiation in the system or integration of its structural elements. A positive moment of the considered process lies in the fact that it «apparently improves the process of legal regulation contributing to the scope of heterogeneous relations and penetration in their essence» [2, 46].

In spite of the scale and relevance of the processes of differentiation and integration in the legal system, legal scientists

mention them, as a rule, generally and talk about the problems of specialization of legislation on the occasions of discussion of the issues of law division into branches, sometimes, without making a clear distinction between these scientific abstractions [1, 53; 5, 167; 6, 51].

The conducted analysis of use of the categories «differentiation» and «integration» in legal science and the humanities in the whole doesn't only show some positive «shifts» in the solution of problems of theoretical learning of complex social systems, but also reveals the prospects of further development of this abstraction in the conceptual range of the general theory of law. Unfortunately, despite the nature of the most important methodological constructs of a systematic approach, the categories «differentiation» and «integration» did not receive solid development in legal science. Often, in the context of learning general issues of the systematic composition of law, scientists restrict themselves to consideration of the problem of its branch structure, description of the notion and classification of law institutions. The processes of fragmentation and unification of the legal system into parts are sometimes performed with the use of subjectively selected criteria without the support of methodological base and consideration of objectively existing regularities.

In conclusion, it should be emphasized once again that it is methodologically correct to view law as not just a simple system, but as a complex highly-organized system consisting of several subsystems that form a certain hierarchy. On the assumption of applied tasks solved by legal science, the legal system is a set of the following structural elements: legal norms, law institutions (sub-institutions) and branches (sub-branches). The legal system, as it was fairly noted by D. A. Kerimov, is not just a combination of subsystems, but a system of subsystems on the basis of and within which the hierarchy of private systems «creating a slim building of legal systemacity: from the base (the system of diverse legal norms) through intermediate «floors» (the system of institutions and branches of law) is formed» [4, 253]. Only based on such methodological positions, it is possible to find the whole sum of general regularities in theory, which explain the establishment of a balanced state of differentiation and integration as two the most important tendencies of law development.

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