

*Historical sciences*

- CURRENT STATE AND PERSPECTIVES OF KAZAKHSTAN HISTORY DEVELOPMENT  
*Nurligenova Z.N.* 2

*Legal sciences*

- LEGAL BASIS OF CHILDREN EDUCATION IN THE MUSLIM FAMILY  
(NORMS OF THE HANAFI TRADITION)  
*Karatyshkanova K.R., Abdrakhmanova L.A.* 7

*Medical sciences*

- VICTORIA 4R HISTOCHEMICAL METHOD FOR STAINING OF INSULIN IN PANCREATIC B-CELLS  
*Meyramov G.G., Abeuova O., Mursalieva G.T., Kanafina B.A., Tukubaeva G.N., Temireeva K.C.* 12
- PROVISION OF FREE SPECIALIZED SURGICAL CARE IN A SANATORIUM  
FOR RESTORATION OF KAZAKHSTAN WOMEN'S FERTILITY  
*Omarova G.K., Khassenova M.D., Rakhimzhanova A.Kh., Orazkulov M.O.* 17
- EFFECT OF INCREASED RADIOACTIVE BACKGROUND ON QUALITY OF LIFE OF HEALTHY  
RESIDENTS IN MAILU-SUU AND CHRONIC OBSTRUCTIVE PULMONARY DISEASE PATIENTS  
*Turatova T.D., Belov G.V., Pirmatova A.K., Duishobaev A.R.* 22

*Philological sciences*

- THE WAYS AND MODELS OF NUMERALS-BASED WORD-FORMATION  
IN MODERN ENGLISH  
*Azhibekova G.D.* 25
- CONCEPTUAL APPROACH TO STUDYING OF THE KYRGYZ LANGUAGE  
*Sagynbayeva B.* 30
- THE CATEGORY OF VOICE AND ASPECT AND THEIR INTERACTION  
*Ten M.G., Kakzhanova F.A.* 35
- THE FUNCTIONAL SIGNIFICANCE OF METAPHORS IN THE WORKS BY OSCAR  
WILDE – “AN IDEAL HUSBAND”, “A WOMAN OF NO IMPORTANCE”,  
“LADY WINDERMERE”’S FAN”, “THE IMPORTANCE OF BEING EARNEST”  
*Zhdanova E., Beiskhanova S., Jantassova D., Yarema T.* 39

*Technical sciences*

- INFORMATION TECHNOLOGIES OF THE FUTURE: NANOROBOTS  
*Ivanko A.F., Ivanko M.A., Kulikova E.V., Kuznetsova V.V.* 46
- COMPUTER-BASED ARTIFICIAL INTELLIGENCE SYSTEMS  
*Ivanko A.F., Ivanko M.A., Vinokur A.I., Kulikova E.V.* 49

## CURRENT STATE AND PERSPECTIVES OF KAZAKHSTAN HISTORY DEVELOPMENT

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The article presents topical issues of the formation and development of the modern Kazakhstan history. The author drew specific attention to the significance of the Presidential program in the context of a new historical consciousness formation. It facilitated the creation of conditions for a qualitative leap of Kazakhstan history on the basis of advanced methodology and methods. This program also contributed to the expansion of the horizons of the national history of the Kazakhs, the formation of a new historical world outlook of the nation and the comprehension of two decades of modern history of Kazakhstan. At the present stage the modernization approach as the most relevant to the pace of economic, political and socio-cultural development of the Republic of Kazakhstan in terms of independence should compile the basis of history methodology and concept of historical education. The choice of an objective development strategy of the republic and its consistent implementation led to the discovery of new chapters in the modern history of Kazakhstan. Stability and growth of economic development rates in Kazakhstan were marked by a qualitatively different level of statehood, real sovereignty and transformation of an entire socio-political system. The study of the history of the Republic of Kazakhstan is dictated by its rich historical heritage arising from its geopolitical location in Eurasia.

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**Keywords:** historical science, scientific research, information age, independence, the Republic of Kazakhstan

*“The people who do not respect their own history do not respect themselves ... Careful attitude towards the history is the best guarantee that we will not make new tragic mistakes today and tomorrow”*

N.A. Nazarbayev

Life prospects of the people of Kazakhstan became more diverse and in many ways real when it got the independence. The preservation of the republic integrity as a social organism at the level of nation and society remains the main task when the country's stability, well-being and security are promoted. Consolidation of civil and spiritual, ethnic and national identity, increased socio-cultural and socio-psychological activity of the population put together the development priorities of Kazakhstan society. The entire history of the Kazakhs and the nowadays' history of an independent Kazakhstan represent the history of unity, concord and solidarity, mutual understanding with neighboring countries. The past of one's nation is not forgotten by the one who advocates peace and equality, recognizes powerful wisdom of one's nation and looks to the future of one's country with hope.

History, studying a historical process, leads to the appearance of reflection in the form of the history of historical science. A historian cannot fail to express his attitude to the issues discussed in science on the problems he is studying. According to V.L. Muraviev, “historical process, creating an auto-reflection and historical sciences, raises this auto-reflection to a degree, forming the history of the historical sciences” [1]. Historiography shows that there

is a definite distinction between the historical process and the ideas of historians about it; in addition, historians perceive the same event in different ways. Historiography is intent to deal with the reasons why various judgments about historical events appear.

The formation of national history (national historiography) is a strategic direction for the development of any modern state, going far beyond the framework of academic science. Measures to counteract the attempts to rewrite history, both in our state and in a number of post-Soviet countries, are deeply symptomatic and in a certain sense even a milestone event. This issue is also very relevant from a theoretical and political point of view. Unfortunately, since the second half of the 80s of the last century, this problem has found a trend. In particular, the younger generation of historians is keen on it, following the example of certain members of the older generation. As it is well known among professional historians and reputable scientific schools, history, that is the collective memory of society about its past, represents in its essence a virtual, in a sense, even an imaginary world. However, in this virtual world we can see a real battle with the participation of actual parties in interest. Something like this was hardly possible in the historical reality of the Soviet period. This can be seen as one of the clearest manifestations of the fact that humanity has actually entered the informational era of its evolution. The State Secretary M. Tazhin noted in the report of the interdepartmental commission: “Today, Kazakhstan is a successful state. We have entered a new phase of state formation. The strategy

“Kazakhstan-2050” gives an answer to the major questions at the new stage of development, namely: where are we going and where do we want to be by 2050? Generally speaking, this is a matter on the creation of a new ideological model of the country’s future, identification of essential values and guidance. These values must be modern and strengthen national identity in a globalizing world. They must ensure the preservation of the cultural code of the nation: language, spirituality, traditions and culture. Therefore, the Head of the State emphasizes that “an all-Kazakhstan identity must become the core of the nation’s historical consciousness” [2].

Such formulation of the problem objectively focuses attention on the study of national history. Today, completely new demands are made on historical science and there has been a critical reappraisal of cognitive methods in a world historiography.

Firstly, modern history has become an interdisciplinary science, and historical research has ceased to focus on the study of exclusively written sources and work in the archives. They apply the methods of numerous related scientific disciplines.

Secondly, the role of a scientist has become different. The methods of phenomenology and hermeneutics have changed the type of historical research itself. Nowadays a historian is not just a “recorder” of events who writes down and describes the facts. The scientist must achieve a “comprehension” of the values, rules and morality of a particular society. In terms of such approach, each national history appears not as an abstract chronological annals of structures and civilizations, but as a living history of a nation with all its complexity and uniqueness.

There is no doubt that domestic historiography should seriously change its methodological and language means. Nursultan A. Bishevich Nazarbayev, substantively dealing with national history issues, proposed to develop a special program of historical research called “The nation in the stream of history” (“Halyktarihtolkynynda”). In 2013, there was an adoption of this program on the system search and study of documents from the history of Kazakhstan, stored in the world’s largest archives. As noted by the Head of the State N.A. Nazarbayev: “I am deeply convinced that the national history of Kazakhstan should be based on the principles of our society’s unity, friendship and mutual understanding with neighboring countries. With this in mind, it is necessary to conduct both research and

teaching in schools and universities in such a manner” [3, p. 417].

Its major goals are the creation of conditions for a qualitative leap of Kazakhstan history on the basis of advanced methodology and methods; the expansion of horizons of the national history of the Kazakhs, the formation of a new historical world outlook of the nation and the comprehension of two decades of modern history of Kazakhstan. This initiative of the Head of the State was not accidental. The future is impossible without reliance on the historical past.

It is necessary to comprehend the national history and create a holistic national historical picture from the point of view of modern science. The current territory of Kazakhstan for the most part corresponds to the area of settlement of the tribes that formed the Kazakh ethnos. The establishment of the title ethnos is a process that occupied more than one millennium, but, unfortunately, has not been studied enough.

Kazakhstan people had a very difficult and long path to independence and freedom. Now it is time to reevaluate everything and give a fresh look at the national history of the people. Thus, the history of Kazakh people was endangered and at risk by the system of imperial administration during two and a half centuries. The Soviet ideology banned the publication of scientific and historical works on the issues of national problems as they would point the direction to the national revival. The historical science of Kazakhstan is going through a difficult phase of establishment as an independent scientific discipline. This means to move away not only from the obsolete schemes and structures of the historical past based on the beliefs of a class struggle. It suggests the formation of a new concept of the own history of the Kazakh people which is free from the ideology of the Soviet historical school. Accordingly, the role and place of the history of Kazakhstan in the political and socio-economic spheres of society are changing. The result of all the changes was the desire of the Kazakh people to rethink their history. And it refers to the restoration of an objective and free picture of the historical past of Kazakhstan. In its turn, this represents the basis for the revival of historical memory of the people, one of the most important factors to form national unity, civic education and patriotism. In this regard, it is necessary to pay special attention to the words of the Leader of the Nation: “We need to continue working on the formation of historical consciousness of the nation,” noted Nursultan Nazarbayev in the historical

document “Strategy”Kazakhstan-2050”- a new political course of the established state:”All-Kazakhstan identity should be the core of the historical consciousness of our people”.

Today, a Kazakhstani of any ethnic or religious affiliation is an equal citizen of his country.

The Kazakh people and the state language act as the unifying core of a developing Kazakhstan civil community.

We are creating such a fair society where everyone can say: “I am a Kazakhstani and all the roads in my country are open for me!

All the roads and opportunities are open today, and there are no limits for our citizens.

There are many of us, and we all are the one Country, one People.

To be useful to one’s country, to be responsible for the fate of one’s Motherland is a duty and honor for every responsible politician, for every Kazakhstani.

We have made the values of unity and harmony as a foundation of society, the basis of our special Kazakhstan tolerance.

We must carefully transfer these values to each future generation of Kazakhstanis”[4].

Over the years of independence, Kazakh historians have attempted to develop new approaches that allow seeing the historical process as it really was – interconnected, integrated, and in the process of development. There appeared works written on the basis of new archival funds, publications opening unknown pages of the history of Kazakhstan – the deportation of the peoples of the USSR to Kazakhstan and the republics of Central Asia, collectivization, repressions of 1930-1950, and others. However, the process of rethinking the historical past of the Kazakh people had a negative side. Many works emerged, especially on the new and modern history of Kazakhstan. They exposed the past, historical facts were rejected or considered only in a negative way.

The issue on the ethnogenesis of the Kazakhs, the origin and semantics of the term “Kazakh”, the genesis and evolution of the Kazakh statehood, the formation of the ethnic territory of the Kazakh people became a pressing problem. Today, many aspects of this problem have been investigated: the territorial boundaries of the settlement of the Kazakhs, the time of the Kazakh khanate formation and the establishment of its continuity from the Turkic Kaganates and the Kipchak-Mongolian states. The problem of the Kazakh statehood in the Soviet historiography held a subordinate position, and this became a subject of discussion during the Soviet period. Moreover, the prob-

lem had several points of view, which are still present in the Russian historiography.

The history of Kazakhstan of modern age – XVIII – early XX century. This period correlates with the colonization of Kazakhstan by the Russian Empire and the analysis of the consequences of this process. The Soviet historiography has accumulated a seemingly tremendous material, but all studies were based on a limited range of archival data, which, in turn, underwent a kind of peer review. An example of this approach is the assessment of all the uprisings and movements of the Kazakh people in the XIX – early XX centuries, for instance, the uprising of 1916. Due to the work of Kazakhstan historians, the emphasis in relation to the assessment of the national movement in Kazakhstan during this period was changed. The movement of K. Kassimov was rehabilitated. It is interpreted today as the culmination of the national liberation movement of the Kazakh people during the period of their accession to Russia. There is a need to create a capital research on the issue of the accession of Kazakhstan to Russia. The problem of Russian economy influence on the pasture-nomadic community of the Kazakhs is being widely discussed. The work of N.E. Massanov “The nomadic civilization of the Kazakhs”, published in 2001 is particularly vivid in this respect. This author, unlike the Soviet historians, argues that the capitalist structure, which gradually penetrated into the economy of Kazakhstan, could not seriously affect the Kazakh auland lead to its transformation, delamination and decomposition. The colonial authorities, on the contrary, sought to preserve the clan system and the patriarchal way of life in Kazakh society. Consequently, the concept of historical science should be based on the unity of the system of views on historical events. A new approach should be applied to the presentation of historical events as a continuous process of acquiring national identity, not reducible to the enumeration of names and creative achievements, but logically linked to the historical past, political and socio-economic development of the country. If we rely on scientific historical analysis, it is possible to obtain new historical knowledge, fresh ideas and a positive contribution of historical science to the country modernization, its humanitarian support; no social and economic tasks can be solved without it. It is necessary to make wider use of the spatial approach in presenting historical events, which makes it possible to explore the history of Kazakhstan within the framework of specifically local historical time more reliably and more fully.

One of the most significant components of the Kazakhstan model of government is the role of a leader. It is essential to analyze a number of aspects of Kazakhstan Leader activity from scientific points of view. Firstly, over two decades, we can definitely talk about a strategic vision. We have seen many bright politicians, who flashed like a meteor, in different regions of the planet over the years. However, to determine the country development strategy for decades to come and not just to predict, but also to implement these plans is a property of a strategically minded politician. Moreover, the leader understands – they will not always agree with him, he must have enough strength to go sometimes against public opinion, taking upon himself the burden of responsibility for a successful future. Secondly, it is predictability. Not all leaders have it. Many people confuse it with populist promises during the election campaigns. Our Leader never promised social utopias, but he was meticulously about what he promised and he implements it every time. Thirdly, it is an innovative management style. The President of the Republic of Kazakhstan is focusing on innovative development and technological progress. The competitiveness of the country is only in accelerated technological development. Fourthly, it is an intellectual scale of an individual. All the major projects of internal and external nature – from the CICMA to the World Religions Forum, from the OSCE Summit to EXPO-2017, from the transfer of the capital to the strategies “2030” and “2050” – were based on intellectual developments of the President himself. But each of these projects could have done honor to any major politician of our time. All these facts, ideas and events should receive a systematic and objective assessment.

During the years of independence, well-known historians of the republic at a wider meeting of the Interdepartmental Working Group clarified the analytical conclusions of the official state ideology on national historiography not only as one of the facets of national history development, but also as one of the strategic directions of internal and external-state policy. The main problematic historical blocks that Kazakhstan historiography needs to be developed today are as follows:

- the problem of a “common past” formation for an ethnically heterogeneous community of citizens of sovereign Kazakhstan;
- criteria to evaluate the Soviet period of national history in the context of formation of the paradigm “independent Kazakhstan as the Fatherland”;

- the tasks of scientific determination of a forming period of the Kazakh ethnos and its statehood;

- the problems of civilization (“super-ethnic”) orientation of the Kazakh ethnic group in history, as well as the Kazakh civil society in the present and future [5].

The above material clearly indicates that the scope of national historiography goes far beyond the scope of academic science in its significance and is directly related to the areas of strategic interests and national security of any modern state. The latter is particularly relevant for Kazakhstan and other states of the post-Soviet space, which have recently gained political independence, and are currently actively building their national identity. Delaying a solution, or ineffective solution of key historiographic problems in the medium and long term, can give rise to serious challenges to national interests and even state security.

According to the results of extended meeting of the Interdepartmental Working Group on research, writing and study of national history, the tasks set in the works of the President of the Republic of Kazakhstan were fully approved. In this aspect, it was emphasized that we need a modern and truly scientific uniform state standard of historical education at schools and universities. A standard that would be based on the most modern research methods and teaching methods. Marat Tazhin highlighted five main positions in the re-creation of national history, including:

1. National history should be central to the social sciences.

2. It is necessary to work out a qualitatively new general concept of the history of Kazakhstan, which should be closely linked to the world history and convincingly show the place of Kazakhstan in global historical processes, the system of their interconnection and scientific periodization.

3. Primary attention should be paid to the collection, systematization and classification of all historical materials about Kazakhstan available in the country and abroad, it is necessary to investigate all the main foreign repositories of historical artifacts scrupulously, and also to study the possibility of repatriating these historical data to the country, or, if it is not possible to copy them to provide further access for scientists and general public.

4. The study of the Central Asian nomadic civilization, the guardian of which is currently the Kazakh ethnic group, is among the priorities.

5. To deal with the issue of preparing high-quality history textbooks timely.

The significance of the Presidential Program in the context of a new historical consciousness was the creation of conditions for a qualitative leap in the historical science of Kazakhstan on the basis of advanced methods and methodology; the expansion of the horizons of the national history of the Kazakhs, the formation of a new historical outlook of the nation; understanding of two decades of modern history of Kazakhstan. In turn, the materials of the extended meeting of the Interdepartmental Working Group will give a tangible impetus to the modernization and enrichment of national history and give new guidelines for its researchers.

Thus, the study of the history of the Republic of Kazakhstan is dictated by its rich historical heritage arising from its geopolitical location in the Eurasian space. As it is known, the territory of modern Kazakhstan was the scene of many-sided historical events that influenced the course of world history, in which Eurasian nomads took part. At the same time, this heritage makes history have certain problems when it studies the so-called “white spots”, the research of which is difficult due to the lack of written sources or the fragmentary information on the history of Kazakhstan. This relates, first of all, to the ancient and early medieval history of Kazakhstan, studied mainly on the basis of archaeological material. Also, there is a need for an objective source analysis and synthesis of an entire set of available resources. Reconstruction of history should not be built on the idea of the historian, but on the identification of historical facts and an objective interpretation of the historical source. At the same time, the progress of historical science depends on the appearance of new sources and their careful study in science. An objective historical assessment of historical process, phenomenon, event and personality should be given in terms of significance and role of the people and state in history, one should not allow the distortion of history in favor of anyone's interests. It is necessary to distance from the descriptive history and proceed to the identification of objective causes of historical process, to move away from the principle of idealized history, identifying both positive and negative sides. The urgency of solving the problems of Kazakhstan history is also determined by the role of history of a national identity formation arising from the consolidating and educational functions of history.

We would like to conclude the study with the words of Nursultan Abishevich Nazarbayev:

“One is mistaken who thinks that Kazakhstan was far from the main road of history. Numerous state formations existed on its ancient land, which, like people, experienced periods of childhood, youth and maturity, the epoch of its heyday, ruin and rebirth from the ashes. Restoration of independence is the natural compensation of the sacrifices made by our ancestors in the centuries-old struggle for freedom. The triumph of historical justice, made by the will of fate itself, is a merit of our grandfathers and great-grandfathers, defending this immense land with the point of a spear and the power of a smashing blow”.

Honoring our ancestors, we confidently move forward, drawing strength from the freedom-loving spirit of the Kazakh people, which it proudly carries from the times of the Kazakh khanate to the creation of an independent state. The historical memories helped the people to rally around the Leader of the nation and meet the challenges of the times, and assisted Kazakhstan to become one of the leading states of the modern world.

It should be noted that by now there is an urgent need to fill the content of the Kazakhstan development model in the period of independence with real scientific and historical knowledge. This would consist in identifying the main reasons and factors of successful overcoming the post-Soviet stage and Kazakhstaneconomic and ideological and cultural self-sufficiency. Today, the field of historical education is relevant for the historical science of Kazakhstan.

The achievements of modern Kazakhstan historical science allow us to state the fact that new research is needed in the field of national history along its entire length. The competitive side of such studies and their social significance should be determined by the presence of theoretical generalizations, in-depth analysis of empirical material, and access to the world standards to obtain scientific results.

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## LEGAL BASIS OF CHILDREN EDUCATION IN THE MUSLIM FAMILY (NORMS OF THE HANAFI TRADITION)

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Purpose of the study: to examine the basics of raising children in a Muslim family and to show the role of the Hanafi legal school in instilling religious values in the family. Research materials: archival materials on the study of the norms of the Hanafi school in Islam with the analysis of additional information of Turkish and Russian authors. Research methods: set out the norms and traditions of raising children in a Muslim family, guided by the canons of the Hanafi school of law. Lifestyle and methods of education of the Turkic peoples in the Central Asian region are based on the teachings of the famous scientists Imam Azam Abu Hanifa and Imam Maturidi. The need for continuous upbringing and education in the family, in the conditions of today's social change, requires a deep study of the origins of religious education and law. In order for the upbringing in the family to be fruitful and preserve the historical and spiritual connection with the past, it is necessary to study the heritage of great religious thinkers who are at the roots of national traditions and values. The study reveals the role of the family in raising the younger generation as a motivator of resilient values and morality. The authors come to the conclusion that the preservation and strengthening of the foundations of the family was largely related to the religious beliefs of Imam Azam Abu Hanifa, who managed to combine the values of religion and education in the matter of raising children.

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**Keywords:** Hanafi tradition in Central Asia, the teaching of Imam Azam Abu Hanifa, the role of the institution of the family and its rights in Islam, the combination of morality and education in parenting, the duties of parents

Today's social changes, the development of the national model of continuous education and upbringing, require a deep study of the origins of the national culture. It is very important for the younger generation to organize well-educated and educational work, based on advanced knowledge and ideals, in ensuring a bright future for the country. Despite the rapid changes in the political, social and cultural spheres of life, the family, as the main organization of social life, has retained its significance and beingness. The family plays a huge role in the upbringing, development and prosperity of the child from the moment of his birth until his death [1, p. 21]. In order for the upbringing in the family to be fruitful and preserve the historical and spiritual connection with the past, it is necessary to study the heritage of great religious thinkers who are at the roots of national traditions and values. Most of the spiritual heritage is stored in the archives and book collections of Kazakhstan and Uzbekistan. Lifestyles and methods of upbringing of the Turkic peoples in the Central Asian region are based on the teachings of Imam Abu Hanifa and Imam Maturidi.

### **Turkic-Islamic world and Imam Azam Abu Hanifa**

Since the inhabitants of Central Asia are Muslims, the colonialists paid great attention to the study of Islamic laws and customs, in order to effectively manage local tribes and clans. "The Ministry of War and Administration of the Turkestan Territory, in the consciousness of this view on the management of our Mus-

lim outskirts, is supported in Tashkent by" Industrian's Courses "in which officers preparing for administrative policing posts, not only learn living languages of natives, but also get acquainted with Muslim law studies" [2, p. 2], a fragment of this decree notifies that being a Muslim, the people of the Turkestan region adhere to the Sunni trend in Islam and that there is a Sharia law common to all – a legal code that is inherent only for this margin. This article also states that every Muslim lives according to Sharia law, which is a set of laws established by Imam Hanafi, which guides Turkestan Muslims: "In other words: Turkestan, Bukhara, Turkish, and other muslims are guided in their faith and life by one law, and not by different codes, such as Russian, French, British, etc ... Shariat is not a simple guideline and rule for different departments of human rights, but an encyclopedia of law for all this departments – religion, civil, criminal, etc .... In this order, the rulings are set forth in the "Mukhtasarul-Vikaya" (fiqh) law manual compiled by Ubaidulla Sadrishariatom, the famous theologian of Bukhara, the most widespread among the Hanafi people [2, p. 3]. In other words, it becomes obvious that the Turkic peoples, guided by the teachings of the Hanafi, associate with them their national traditions, customs and cultures. The territory of Mavrennakhra was part of the Islamic civilization in the Middle Ages, and everyone in the world recognizes the rich religious heritage left by our ancestors.

As soon as the states of Central Asia acquired their sovereignties, they began to study their national traditions and religious values.

Kazakhstan's aspiration to study traditional religions in the years of independence can be traced to its desire to study the Islamic heritage of such valuable ones as Imam Azam Abu Hanifa, Imam Maturidi, Abu Bakr Dzhuzjani, Abul Yusr Pazdavi, Abul Mouin Nasafi, Sobuni Buhori and others [3]. Due to the fact that Muslim families adhere to the norms, customs and traditions corresponding to Sharia, the head of the family must simultaneously ensure internal order in the social group and protect it from external encroachment, while all other family members headed by this person obey him. The institution of the family in Muslim law is characterized by a closed economy and the internal structure of the Muslim family group. This leads to the use of extremely harsh measures against women, although these measures are contrary to the principles of the Koran [4, p. 175].

The family system makes an enormous contribution to the formation of a social system that prevents conflicts and family quarrels, establishes cruel punishment for adultery, and at the same time allows polygamous marriages. As a prerequisite for the formation of a strong and influential society, it is important to have a family that understands justice and responsibility, because it is important for family members [5, p. 69]. The Koran and all the Hadiths say that this is the basis of all virtues in Islamic culture, and lie is the mother of all evil. Actions of hypocrisy and absurdity contradict justice in the Holy Quran (Sura al-Mounafikun, 63/8), this is an evil from which a Muslim should be wary of. The first sura of "Nisa" ayat states that the family was considered by people as a structure where needs are realized consciously and purposefully, and this distinguishes them from other living beings, the main purpose of this structure is to promote the continuity of the offspring and contribute to the continuation of the human race. Some people marry and become fathers of posterity, but the physical and spiritual maturity of humanity, the problems of motherhood and personality, and the continuation of the culture of humanity are prerequisites for the continuation of culture of mankind, because the beliefs and customs of the most beautiful way has its origins in the family. As shown in the Quran (Sura Rum, 30/21), family formation is based on the feelings and confidence of both parties.

The founder of the Hanafi mazhab, Imam Azam Abu Hanifa, pursued high moral goals in the family. In order to cognize a person, he considers the old and new orders of civil society in two parts:

a) Order calling to be dependent on society: where all human needs are satisfied by society or carried out under state control.

(b) An order that supports human development and teaches virtue, and then gives him complete freedom. During this process, a person can protect himself from evil, eschew the bad and strengthen his morality and religion. Imam Azam Abu Hanifa was inclined to the second order. The choice of the latter by Imam Azam Abu Hanifa is clearly seen in his decision on the question that the girl herself should decide with whom to create a family. However, the ulama of other madhhabs came to a disagreement with Imam Azam Abu Hanifa: the faqihs, together with the recognition that the girl could not marry the man the guardian preferred for her, said that she also could not start a family on her own, without the consent of the guardian [6, p.244]. Guided by the moral principles of Imam Azam Abu Hanifa does not agree that the guardian decides the fate of the girl, in his opinion the purpose of guardianship is prevention from mistakes and shortcomings.

#### **Characteristic features of raising children in a Muslim family**

The responsibilities of parents in relation to children in the family are set forth in the literature on sharia law. In Sharia family law, according to the Hanafi mazhab, a mother is obliged to breastfeed and support her child, as well as to educate from birth to puberty regarding sons, and daughters to their actual marriage. Every newborn brings happiness and love to the family. This puts the responsibility on the parents before the child. Parental responsibilities can be divided into 3 parts:

1. Reimbursement of the material needs of the child. First of all, it is necessary to meet the physical needs of the child, such as food, drink and health. The Prophet (peace be upon him) said that the best way to do charity is to help the family. In another Hadith, he says: "It is a sin for a man to refuse to meet the needs of his family".

2. Treat the child with kindness and love. The Prophet Mohammed (peace be upon him) looked upon his children, grandchildren and other children with tenderness and love. For example, in Hadiths much was told about the need for affection, playing with children, forgiving their mistakes. He answered the following to those who criticized him for the love of children: "If God took your heart, what can I do?" Modern psychology assumes that spiritual intercourse and material relations, such as the love and kindness of parents,

are important for a child, and children deprived of such relations may have difficulties in upbringing. At the same time, such children often commit crimes. With regard to the health of the child and the health of his soul, the most important is breast milk. The proof is the ayat in the Quran: "And the mothers feed their children for two full years; This is for someone who wants to complete the feeding. And on the one who was born – their food and clothing according to custom" (Bakara, 2/233). Often parents do not pay much attention to breastfeeding for the upbringing of children. However, in the early months child is taught cleanliness and order. In addition, medicine also proved that breastfeeding is one of the most important factors affecting the future health of the child. Psychologists say that at this stage self-confidence, secrecy, openness, cowardice or courage of a child are formed. Even when the mother takes the baby in warm embrace for nursing, it is of great importance for the baby. It influences which one the child will be optimistic or pessimistic. In addition, at this stage, the nervous system is formed, which affects which one the child grows up, intelligent, hardworking, adapted to life, etc. Therefore, childhood in its own way is also important.

3. Child upbringing. One of the most important tasks of parents is to give the child an education, upbringing and a profession. Proof of this is the enormous amount of hadiths, the statement of the Prophet Muhammad: "Take good care of your children and give them an excellent upbringing." In addition to this, the following Hadith: "No father can give more than a higher upbringing to his child," [7, p.165], and places this obligation on parents.

Psychology says that it is useful to consider the age-related separation of children from the point of view of physiological, psychological and mental-emotional development. Because each stage of development is characterized by the essence of the child, the relationship with the environment, the degree of development of thought and certain physiological features. The first ladder of childhood is infancy. In the Holy Quran this is repeated several times. The importance of this period has been emphasized in the Quran several times. Infancy ends at the age of two years from birth. The importance of breastfeeding for a baby is mentioned above. If nursing mothers eat halal foods, the child will become stronger and strengthen in health in the future. In turn, the father of the child needs to earn halal food. This, in turn, is a factor affecting the upbringing of the child. Loving the children and taking care of them as the light of

the heart and the light of the eyes, the merciful Prophet Mohammed prayed for them. It is said that every child raised on the basis of the Islamic faith is a Muslim. Islam pays great attention to the age-related psycho-physiology of raising children [8, 14].

The pre-school period includes the time to reach the child's biennium and the age of Tahmiz, from about from two to seven years. At the age of two years, the child learns skills such as speech and walking. At this age, the importance of raising a child increases. Here is what is said in the hadith of Ahmad ibn Hanbal in the book Musnad: "Every child is born pure in nature. This property lasts up to two years, until he speaks. And only then parents turn him into a Jew or a Christian". Children over 2 years old are more interested in illustrations in books, repeating the names of objects and heroes in the drawings. And he can even tell a fairy tale. Therefore, taking into account the child's abilities, you can read books relate to religion, morality and the environment, and expand his knowledge. When the child turns three, the golden days begin. The child likes to talk, builds good relationships with others. This age is the most convenient time to teach him About a certain order. Scientists believe that 2-3-year-old children tend to get used to everything. During these periods, it is advisable to teach the child something short but useful. A three-year-old boy can learn a short song. He listens to the song and starts singing. You can add religious songs, especially songs performed by young children.

The knowledge necessary for the child in the future should be given before his majority, they should take care of their parents, brothers and sisters, if necessary. In this regard, the child must be raised until the adulthood in order to be able to bear the burden of life. For adolescents, it is also important to have the skills they need in the future and adapt them in the same direction as before they reach their peak. Adaptation to the specialty may be even earlier. This is due to the fact that Muslim scholars believe that if a child is aware of his ability to memorize, he has a good memory, he should focus on science. The reason is that these characteristics are a sign of susceptibility to science. Unfortunately, children in order to meet the expectations of their parents choose a profession according to their advice. In the case when they do not master the profession, they accuse themselves of not justifying the expectation of their parents. Therefore, it is necessary to adapt the child to the profession only in adolescence without haste. If a child has a tendency towards

a profession that does not contradict the nature of a girl or a boy, it is recommended to send the child to this profession. But Muslim scholars say that the child must adapt to the profession after studying religious knowledge [9, p.156]. Therefore, in the last years of adolescence, adaptive education must find its place in education. And it is important that the family and the school work together.

In this regard, the importance and methods of family education are very similar to those of teachers and Muslim scholars. In the work of al-Ghazali "Ihtiy ulumi d-din", issues relating to the education and upbringing of children can be summarized as follows: adults should be an example for younger children, teaching them should be equal to their position, put themselves on a par with them, understand them, give them the opportunity to play, direct them in their activities, teach them patience, and prevent children from doing useless and obscene things. Watching the children, al-Ghazali said that children should know how to behave themselves at the table, behave themselves at home, be patient and modest in their lives, and exercise. Not only physical training is important, but also to train good breeding. It is known that physical culture, sports are the factors of human longevity, but you need to train spiritually to live even longer. For example, being angry with others, being rude and not understanding others is a sign of spiritual and human weakness, which implies the inability of a person to live. A spiritually weak person is physically weaker, too. Al-Ghazali believes that the spiritual principle is based on self-discipline and imitation of a wise teacher [10]. Self-education begins with self-control and self-awareness. Realizing the mistakes of others, we can see our weaknesses and try to overcome them. To overcome moral weakness, you need patience and spiritual strength.

#### **Family as a branch of Muslim law**

In Islamic law, the care and upbringing of children is called hidana. In family life, there is no problem in who should care for the child. Parents do it together. When family life ends for a specific reason, a problem arises, then it will be necessary to decide to whom to shift this responsibility. Raising a child is the responsibility and legal protection of the mother to a certain age. Imam Hanafi assumes that Khidana places the responsibility and rights on the mother. In this regard, the mother does not escape responsibility [11, p. 244]. If the mother is not healthy, then this right and responsibility apply to the relatives of the woman. A per-

son who cares for a child and is responsible for him must be an intelligent, caring person, trustworthy in protecting the health and morals of the child. The age at which a child needs breastfeeding and care varies between girls and boys. For young girls – nine or eleven, for boys – seven or nine years. Until that age, the child is next to the mother or her relatives, then, according to the situation, he will stay with his father. Khidana considers the right to pay for the guardian's work if the child does not have a mother. If this fee is the property of the child, then it is paid from it, and if not, then it is paid by the appropriate person [11, p. 245]. The guardian is responsible for supervising the ward, as well as taking care of his/her maintenance, education and all that is provided by law. Guardians are not allowed of a certain remuneration for their work and obligations. Guardians must maintain detailed reports on the management of the property of the minor. If the guardian wants to relinquish the responsibility entrusted to him, he may ask the judge to release him from that. The judge must release the guardian if he accepts the request as substantive. Thus, we can conclude that the main subject of law in the family branch of Islam is not an individual, but the family [12, p. 106]. Family law in Islam is of considerable interest because of its uniqueness, distinctive features, it has proved its viability for a long time and deserves a comprehensive, in-depth further study.

#### **Conclusion**

First of all, it should be borne in mind that Sunni Muslims, in whatever country they live and which state they would not belong to, have a common legislative code for all of them – the Sharia, which applies equally to the national life of the countries of Central Asia (according to the teachings of each country's imam). In other words, Turkic Muslims are guided in their beliefs and in life by a single law, justified by Imam Azam Abu Hanifa.

Raising a generation, regardless of what society and when, is the most important issue. The future of each country, as a whole of the world community, is directly connected with the youth. Any people and any religion has its own characteristics that distinguish them from others. Having started raising a child in the mother's womb, the Kazakh people assign a huge place to national and religious norms, which, according to the canons of the Hanafi mazhab, are one of the sources of Muslim law. Family maturity, charity and spirituality are the main pillars of raising children in general. This is the most progressive manifestation of

national education, combined with religious. Whereas morality and humanity are the cornerstones of education in society. The family, marriage and upbringing of the child cannot be considered separately from these concepts. One of the most pressing problems of Islam is the family agitating the binding nature of marriage, love and kindness. At the same time, Islam attached great importance to the upbringing and education of children.

We are grateful to the Ministry of Education and Science of the Republic of Kazakhstan for grant financing of the research project on the theme “The Hanafi tradition in Central Asia and the foundations of Kazakh spirituality”, within the framework of which this article was prepared.

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## VICTORIA 4R HISTOCHEMICAL METHOD FOR STAINING OF INSULIN IN PANCREATIC B-CELLS

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In article the analysis of results of using of histochemical method "Victoria 4R" of staining of hormone insulin in pancreatic B-cells in comparison with other methods of histochemical analysis is given. By authors it is shown that this method, as well as a Diethylpseudoisocyanine luminescent technic are belong for a high specific for insulin staining methods in comparison with Aldehyde-fuchshine and staining by Dithizon methods and possess in this regard advantage in comparison with other methods. It is shown also that the Victoria 4R method in comparison with Diethylpseudoisocyanine method has two apparent advantages: 1) sections of pancreas after staining can be stored for a long time; 2) the method at the same time is histologic thanks to what also assessment of its contents, but also a possibility for investigation and description of the state of histostructure of pancreatic islets and exocrine tissue of pancreas not only for staining of insulin in B-cells that it considerably improve significance of obtained results. When comparing the Victoria 4R method possess two advantages in comparison with immunohistochemical method for insulin staining: 1) a possibility for investigation and description of the state of histostructure of pancreatic islets whereas the immunohistochemical method is especially histochemical for staining of insulin only; 2) low cost of main staining reagent as Dimethylnaphthylmethan; 3) high cost of kits for immunohistochemical staining of insulin.

**Keywords:** B-cells, insulin, histochemical methods, pancreas

**Background.** Pancreatic B-cells contained a large amount of Zn<sup>2+</sup>ions [1-3] as salivary glands and prostate. In B-cells Zn<sup>2+</sup>-ions take part in processes of biosynthesis of insulin as at processes of storage by forming of Zn<sup>2+</sup>-insulin complex [4,5]. It is known that Zn<sup>2+</sup>-ions in B-cells formed with insulin a deposited form of hormone as Zn<sup>2+</sup>-insulin complex [4]. Proinsulin forms a zinc contain hexamer soon after its synthesis. In addition the Zn<sup>2+</sup>-ions enhance proinsulin's solubility and render insulin insoluble. Zinc ions also appear to play an important role in the microcrystalline character of the precipitated insulin granule[5]. Pancreas of rat, rabbit, dog, cat, some fish, human, birds, mice, hamster, porcine, hoerst, contain a large amount of Zn<sup>2+</sup>-ions [6]. Using of electron microscopy histochemical method it was showed that that Zn<sup>2+</sup>-ions are concentrated in B-cells in B-granules only contained deposited form of insulin [7] and destruction of B-cells caused by Dithizon which formed in B-cells toxic complexes with Zn<sup>2+</sup>-ions, started by destruction of B-granules [8].

There are a few histochemical methods for staining of insulin or zinc-insulin complex in B-cells for to reveal and to estimate insulin content in B-cells:

**Aldehyde-fuchshine method** by Gomori G. Violet granules in cytoplasm of B-cells correspond to deposited form of insulin [10-11]. Intensity of color of cytoplasm of B-cells directly correspond to insulin content in cytoplasm [12-13]. But this method is not high specific for insulin only.

**Staining by Dithizon.** Preparing of Dithizon solution: 30 mg of Dithizon, (MERCK, Germany)+10 ml. bidistillate+0.2 ml 25% NH<sub>4</sub>OH 10 min. mixing on temperature +70<sup>0</sup> at Celsius. Solution was injected intravenously to Rabbits and to Mice 46-48,6 mg/kg.

Frozen sections of 4 mcm were investigated 5-10 min past injection on dark microscopy. Density of staining was measured using photometer. Insulin content was calculated as parameter K = AB1/AB2 where: AB1-density of staining of intact B-cells; AB2-density of staining of B-cells past action of diabetogenic chemicals (calculated as 1,00).

**Immunohistochemical method** staining of insulin. Standart kits for insulin (DAKO, Demark) were used for staining sections of pancreas tissue.

**Diethylpseudoisocyanine fluorescent method.** Schiebler T. and Schiessler S. showed that A chair of oxidized insulin reacted with Diethylpseudoisocyanine chloride with formation of red fluorescent complex which fluoresces in UV light 360-370 nm. We have used modernized by Coalson R.E.method [14-15, 20].

Description of staining procedures. Preparing of staining solution: 0,04% water solution of Diethylpseudoisocyanine (SERVA, Germany). Staining procedures: 1) depa-caffinization of sections in xylol; 2) alcohol 90<sup>0</sup>,80<sup>0</sup>,70<sup>0</sup> 1 min in each;3)washing in cold water; 4) oxidation 0,5-2 min; oxidation solution: 5 ml of 5% H<sub>2</sub>SO<sub>4</sub>+5 ml 2,5% solution of KMnO<sub>4</sub>+30 ml bidistilled water at +28<sup>0</sup> Celsius; 5) washing in cold water; 6) 5% solution of oxalic

acid – 5 sec; 6) washing in 2 portions of cold water; 7) 0,4% cold solution of Diethylpseudoisocyanine – 20 min in refrigerator at +4°C; 8) washing in cold water 5 min; 9) store in refrigerator 1,5-3h.

**Staining of Zinc in B-cells by 8PTSQ (from Institute for High Pure Chemicals, Moskva, Russia).**  $Zn^{+2}$ -8PTSQ complex radiates intensive green fluorescence under UV-light 360-370 nm length of wave [16-19,21] that was confirmed by spectral analysis [8]. Cytoplasm of B-cells not contained Cadmium. Past long time prolonging testing in Institute of High Pure Chemicals (Moscow) 8PTSQ was proposed as fluorescent reagent for identification of very small amounts of  $Zn^{+2}$  in solutions and tissues. Later by Lasaris Y.A. and coll. 8PTSQ was tested for revealing  $Zn^{+2}$ -ions. 8PTSQ is high specific reagent for staining of  $Zn^{+2}$ -ions in pancreatic B-cells. Concentration of Zinc-ions in cytoplasm of B-cells is proportional for concentration of insulin.

**Victoria Blue 4R method staining** of insulin (V4R), Diphenylnaphthylmetane, colour index 42563; **MERCK, Germany; FERA, West Berlin, Germany**). It was showed by F. Wohrab [16] that V4R in aqueous solution interacted with oxidized A-chain of insulin that is accompanied by blue staining of cytoplasm of B-cells proportionally to the amount of insulin [18].

Insulin content was calculated as parameter  $K = AB1/AB2$  [25] where: AB1-density of staining of intact B-cells; AB2-density of staining of B-cells past action of diabetogenic chemicals (calculated as 1,00).

**Aim of work:** 1) staining of insulin in B-cells using of histochemical **Victoria Blue 4R method**; 2) to compare with results obtained by using other methods of staining of insulin and Zinc.

**Methods.** Staining reagents: Aldehyde-fuchsin (MERCK, Germany), Diethylpseudoisocyanine (SERVA, Germany), Dithizon (MERCK, Germany), Dimethylnaphthylmetan (Victoria 4R) (FERA, West Berlin), immunohistochemistry (standard kits from DAKO, Denmark), 8-para (toluenesulphonylamino) quinolin-8PTSQ (from Institute for High Pure Chemicals, Moskva, Russia).

**Animals.** 11 Rabbits 2250-2720g. Group 1. Intact animals (3). Group 2. Experimental diabetes induced by injection of 48,9-52,2 mg/kg of Dithizon (Diphenylthiocarbazone, SERVA, Germany). 4 animals were killed 10 min. after injection of Dithizon and 4 animals – 8-9 days after injection.

Frozen sections of pancreas of animals were investigated using dark microscopy. Blood glucose level measuring – in animals of

2a and 2b groups before injection of Dithizon and 1,3,6 and 9 days after injection. Aldehyde-fuchsin (MERCK, Germany) method [10-13] and Diethylpseudoisocyanine methods were used for analysis state of histostructure of pancreas tissue and of deposited insulin content in B-cells [14-15] as a specific fluorescent 8PTSQ and Dithizon methods for staining of complex “Zn-DZ” and of free ions of Zn in B-cells [8,9,16-21]. 8PTSQ formed fluorescent green complexes with  $Zn^{+2}$ -ions visible using fluorescent microscopy and Dithizon formed red DZ- $Zn^{+2}$ -ions complex visible using dark microscopy. Maximum of absorbance of  $Zn^{+2}$ -DZ complex on spectrum of absorbance correspond for 530 nm [4]. The Victoria 4R staining technology was used for staining of insulin [22-24]. Insulin content was calculated in relative units (r.u.) as parameter  $K = IF1/IF2$  where: IF1-intensity of fluorescence of intact B-cells (B-cells/exocrine tissue); IF2-intensity of fluorescence of B-cells after action of diabetogenic chemicals (B-cells/exocrine tissue). Histofluorimetric complex was used [25] for to investigate intensity of fluorescence and density of staining of insulin in B-cells.

#### Preparing of solutions

Preparing of Dithizon solution: 400 mg+30 ml of bidistillate+0,2 ml of 25% ammonium solution; mixing 10 min at water bath at +70°C, filtration. Frozen sections of Rabbit's pancreas 4 mm were investigated 10 min after injection using of dark-condensor microscopy. Intensity of staining was measured by photometer. 2<sup>nd</sup> part of pancreas tissue was fixed in Ethanol 70% contains dissolved  $H_2S$ ; paraffin sections of tissue were stained by 0,4% acetone solution of 8PTSQ [6, 12, 13] and were investigated on fluorescent microscope. Pancreas tissue was fixed in Bouin 24h.

#### Research results and discussion

##### Group 1. Pancreas tissue of intact animals

**Staining by Dithizon:** a large amount of zinc-insulin complex (red granules) in B-cells (Fig. 1.1).

**Aldehyde-fuchsin staining:** histostructure and insulin content in B-cells (violet color) without changes, (fig.1.5; Table); insulin content in B-cells:  $K = 1,80 \pm 0,06$ .

**Victoria 4R staining:** histostructure and insulin content in B-cells without changes (Fig.1.7.; Table); insulin content in B-cells:  $K = 1,62 \pm 0,05$ .

**Immunohistochemistry:** histostructure and insulin content in B-cells without

changes (Table); insulin content in B-cells:  $K = 1,74 \pm 0,04$ .

**Diethylpseudoisocyanine staining:** histostructure and insulin content in B-cells without changes (Fig.1.9;Table); insulin content in B-cells:  $K = 1,72 \pm 0,04$ .

**Fluorescent staining of  $Zn^{+2}$ -ions:** a large amount of Zn-ions in B-cells: intensive green fluorescence of B-cells (Fig. 1.3, Table); Zn-ions content in B-cells:  $K = 1,75 \pm 0,03$ .

### Group 2. Pancreas tissue after action of Dithizon

**Staining by Dithizon:** a low amount of zinc-insulin complex (red granules) in B-cells (Fig.1.2.).

**Aldehyde-fuchsin staining:** destruction and death of majority of B-cells, marked decreasing of insulin content in B-cells (fig.1.6; Table); insulin content in B-cells:  $K = 1,12 \pm 0,03$

**Immunohistochemistry:** destruction and death of B-cells; marked decreasing of insulin content (Table); insulin content in B-cells:  $K = 1,03 \pm 0,02$ .

**Diethylpseudoisocyanine staining:** marked decreasing of insulin content (Fig.1.10; Table); insulin content in B-cells:  $K = 1,11 \pm 0,04$ .

**Victoria 4R staining:** destruction and death of majority of B-cells, marked decreasing of insulin content in B-cells (Fig. 1.8;Table); insulin content in B-cells:  $K = 1,08 \pm 0,09$

**Fluorescent staining of  $Zn^{+2}$ -ions, DZ:** absence of  $Zn^{+2}$ -ions in cytoplasm of B-cells (Fig.1.4; Table); Zn-ions content in B-cells:  $K = 1,04 \pm 0,01$

Results of comparative analysis of histochemical identification of insulin in pancreatic B-cells using of various methods shown following. All methods demonstrated some differences of insulin content and state of histostructure of pancreas tissue in animals with

diabetes in comparison with intact. Concerning insulin staining two from five methods – Victoria 4R and Diethylpseudoisocyanine method are belong for high specific methods for staining of A-peptide of molecule of insulin. In the contrary, Aldehyde-fuchsin method and staining by Dithizon method are not belong to specific for staining of insulin and zinc-insulin complex only.

Not only insulin but some like hormone substances from adenohypophysis accepted Aldehyde-fuchsin color. However, regarding pancreatic islet tissue it is possible to recognize this method as specific for insulin because other hormones in B-cells are not produced. Staining by Dithizon result color revealing of complex zinc-insulin as red granules in B-cells. Thus, it is possible to determine the content of insulin indirectly only.

The advantage of Diethylpseudoisocyanine method determined by high sensitivity in compared with Victoria 4R method. Shortcomings: 1) histologic slides of pancreas tissue are changeable a limited time only -20-30 min – for microscopic investigation; 2) this method is belong for histochemical technics and not suitable for to investigate state of histostructure of pancreas tissue.

Advantages of Victoria 4R method: 1) fixation of color using of paraffin histological sections of pancreas tissue for microscopy within long time and storage of slides for long period; 2) at the same time the method is suitable for the investigation and description of histological changes of pancreas tissue not only for staining of insulin. This is two of his important advantages.

Both methods do not belong to difficult methods on technical aspects. Dimethylnaphthylmetan – a main color reagent for staining process by Victoria 4R -is inexpensive and is produced by many European firms.

Comparative analysis results of measuring of insulin content in B-cells using of various methods (r.u., parameter K)

№	Method	Intact animals	Diabetes induced by Dithizon	Difference of Indexes
1	Pancreas tissue Aldehyde-fuchsin	$1,86 \pm 0,05$	$1,12 \pm 0,03$ $p < 0,005$	0,89
	Victoria 4R	$1,72 \pm 0,06$	$1,08 \pm 0,09$ $p < 0,005$	0,63
2	Immunohistochemistry	$1,90 \pm 0,04$	$1,03 \pm 0,02$ $p < 0,005$	0,84
3	Diethylpseudoisocyanine	$1,92 \pm 0,06$	$1,11 \pm 0,04$ $p < 0,005$	0,93
4	8PTSQ (zinc reaction)	$2,05 \pm 0,07$	$1,04 \pm 0,01$ $p < 0,005$	

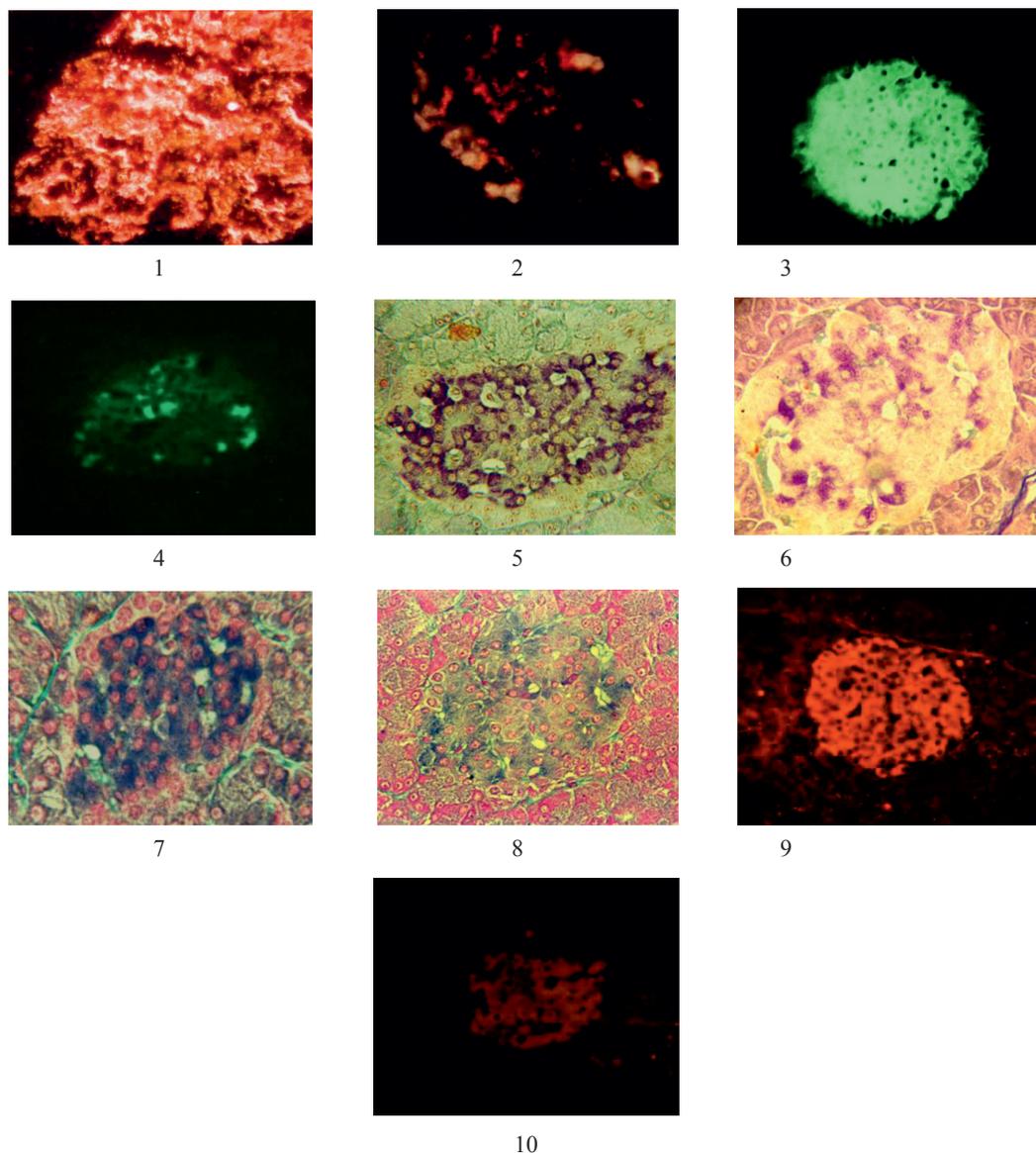


Fig. 1. State of histostructure and insulin content in B-cells of intact animals and animals with diabetes caused by Dithizon (histological materials, staining and microphotos by Meyramov G.G. and co-authors)

- 1.1. Intact rabbit. Pancreas. Staining by Dithizon. Large amount of red granules of Zinc-Dithizon complex in B-cells. Histostructure of B-cells without changes; x280;
- 1.2. Diabetes. Pancreas. Staining by Dithizon. Absence of Zinc in B-cells; x280;
- 1.3. Intact rabbit. Pancreas. Fluorescent positive Zinc reaction with 8PTSQ in B-cells (intensive green fluorescence of cytoplasm of B-cells). Histostructure of B-cells without changes; x140;
- 1.4. Diabetes. Pancreas. Fluorescent negative Zinc reaction with 8PTSQ in B-cells (absence of fluorescence of cytoplasm of B-cells). Staining by 8PTSQ; x140;
- 1.5. Intact rabbit. Pancreas. Aldehyde-fuchshine staining. Histostructure and insulin content (violet color) in B-cells without changes; x280;
- 1.6. Diabetes caused by Dithizon Pancreas. Aldehyde-fuchshine staining. Destruction of B-cells and marked decreasing of insulin content in B-cells; x280;
- 1.7. Intact rabbit. Pancreas. Staining by Victoria 4R. Positive reaction for insulin in B-cells (intensive blue color of cytoplasm of B-cells). Histostructure and insulin content in B-cells without changes; x280;
- 1.8. Diabetes. Pancreas. Staining by Victoria 4R. Negative reaction for insulin in B-cells. Destruction of B-cells and marked decreasing of insulin content; x280
- 1.9. Intact rabbit. Pancreas. Staining by Diethylpseudoisocynine. Positive reaction for insulin in B-cells (intensive red fluorescence). Histostructure and insulin content in B-cells without changes; x140;
- 1.10. Diabetes. Pancreas. Staining by Diethylpseudoisocynine. Negative reaction for insulin in B-cells (low fluorescence); x140

This method is used not often, that is why we propose description of staining procedures. Staining procedures:

- 1) deparaffinization of sections;
- 2) washing in cold water a few min;
- 3) oxidation 3-5 min (oxidation solution: 0,3%  $\text{KMnO}_4$  50 ml + 0,3%  $\text{H}_2\text{SO}_4$  50 ml; wash slides;
- 4) place sections in 2-5% water solution of sodium bisulphate – 1 min; wash slides;
- 5) 70° alcohol-1 min;
- 6) staining solution (96° alcohol 100 ml + Victoria Blue 4R – 1g) 15 min – 2h; wash slides;
- 7) staining on 0,5% water solution of Phloxine 30-120 sec.; wash slides;
- 8) 5% water solution of phosphor wolframic acid 1-2 min; wash slides; in water;
- 9) staining in 0,5% water solution of Light Green 1-2 min;
- 10) dehydration in 96% alcohol.

Insulin content was calculated as parameter  $K = \text{AB1}/\text{AB2}$  where: AB1-density of staining of intact B-cells; AB1-density of staining of B-cells past action of diabetogenic chemicals (calculated as 1,00).

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## PROVISION OF FREE SPECIALIZED SURGICAL CARE IN A SANATORIUM FOR RESTORATION OF KAZAKHSTAN WOMEN'S FERTILITY

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Starting from 2015, for the first time in Kazakhstan, minimally invasive operations were introduced into the sanatorium medical practice at the Sanatorium "Okzhetpes" "Almaty" in the framework of providing a guaranteed volume of free medical care to patients. Examined population comprised 83 patients with various gynecological pathologies. The proportion of patients of reproductive age was 80.7%, non-working patients – 62.6%. Experimental introduction of hysteroscopy, hysterorectoscopy, laparoscopy and vaginal surgery in comfortable sanatorium allowed to significantly shorten the rehabilitation period, contributed to the early restoration of fertility and the onset of pregnancy in 20% of patients with previous long infertility caused by infertility of mixed genesis, infertility of tubal-peritoneal genesis, endometriosis, infertility of ovarian genesis, infertility of uterine origin. Women from socially vulnerable segments of population note an improvement in subjective evaluation of life quality. The results allow projecting this experience on similar medical institutions of sanatorium-resort type.

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**Keywords:** Infertility, fertility restoration, quality of life, sanatorium, laparoscopy, hysteroscopy

In the late 20th century, there was a significant emigration of population (15-20%) from Kazakhstan, including qualified medical workers. The government of Kazakhstan has taken a few legislative acts to overcome the undesirable tendencies associated with the deterioration in the level of medical care. The protection of reproductive health, maternal and child health, the improvement of the quality of life of women, as well as the guaranteed volume of free medical care (GVFMC) in the Republic of Kazakhstan are guaranteed by legislative acts [1,2]. GVFMC is granted to citizens of Kazakhstan and immigrants (oralmans) at the expense of budgetary funds [1], and includes preventive, diagnostic and therapeutic medical services which have the greatest proven effectiveness [3]. As a rule, recovery treatment and medical rehabilitation of patients are conducted in sanatorium-resort organizations [4-7]. Starting from 2015, at the Sanatorium "Okzhetpes" "Almaty" for the first time in Kazakhstan, minimally invasive surgical methods such as hysteroscopy, hysterectomy, laparoscopy, vaginal surgery, cystourethropy were introduced into the medical practice of the sanatorium clinic.

The aim of this work is to study the effectiveness of experimental introduction by gynecological service into medical practice of the clinic of the sanatorium "Okzhetpes" "Almaty" of free specialized and high-tech medical care with the use of endovideosurgery and their influence on restoration of women's fertility.

### **Clinical techniques of treatment in the sanatorium-resort organization**

Sanatorium "Okzhetpes" "Almaty" in Almaty is a modern multi-functional sanatorium

and resort complex, which provides high-quality medical services by doctors in 26 specialties [4], comfortable rest, as well as therapeutic rehabilitation using natural, climatic and other factors in 13 different profiles, including diseases of circulatory, nervous, musculoskeletal and genitourinary systems, respiratory, digestive, nutrition disorders, metabolic disorders, etc.

Patients from Kazakhstan, Russia, Canada, Kyrgyzstan, Latvia, Uzbekistan, Tajikistan and other countries note the effect of the treatment and improvement of the subjective evaluation of life quality [5]. This contributes to the development of medical tourism [7,8]. However, the cost of the voucher, including payment for 4 meals a day, accommodation and reception of physiotherapy procedures up to 40 titles, is 25000 tenge (\$ 80, December 2015) per day and is not always available. As is known [9], rural population, especially non-working women, often faces many obstacles to access to high-tech medical services (HTMS) and long waiting for the necessary medical care [10,11]. Specialized medical care (SMC) is 70000 tenge (\$220) for the operation of hysteroscopy, 107000 tenge (\$340) for the operation of laparoscopy and 600000 tenge (\$1900) for highly specialized medical care operation. In this relation, sanatorium "Okzhetpes" "Almaty" has significantly expanded the list of free medical services within GVFMC [12]. As an experiment, such minimally invasive methods of surgical treatment as hysteroscopy, hysterorectoscopy, laparoscopy, vaginal surgery, cystourethropy, were firstly introduced in the medical practice of sanatorium clinic.

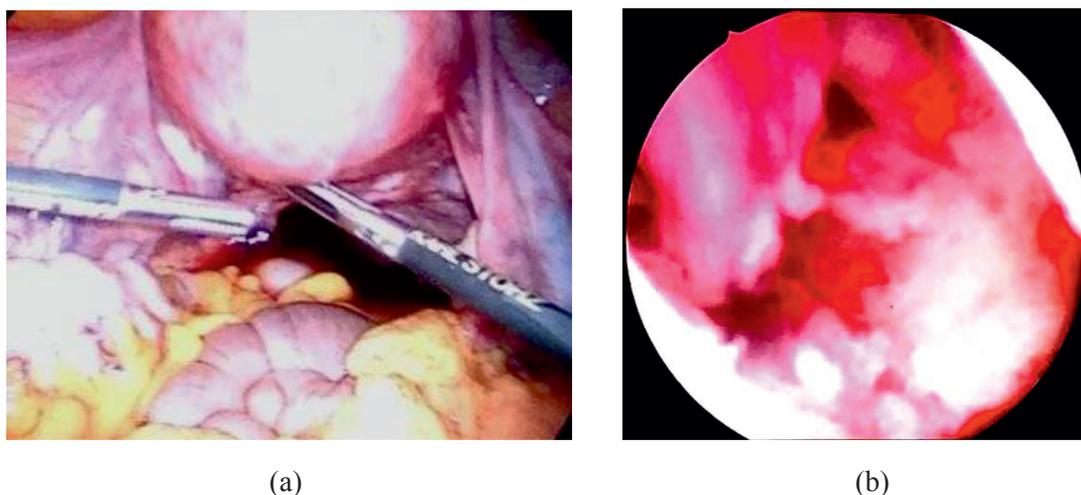


Fig. 1. Surgical operation laparoscopy (a) and hysteroscopy (b) in the clinic of Sanatorium “Ok-Zhetpes” “Almaty”

The main tasks of the gynecological service of the clinical diagnostic center of sanatorium “Okzhetpes” “Almaty” are introduction of advanced technologies in the field of gynecology, the provision of specialized and high-tech medical care in diagnosis and treatment of gynecological diseases with the use of endovideosurgery [12, 13]. Since 2015, the gynecological service is a participant in the republican program for the provision of SMC to the public in framework of the state order. The solution of these tasks is carried out by the employees of the Department of Obstetrics and Gynecology No.1 of Asfendiyarov KazNMU.

#### Materials and methods of research

For 2015-2016, 83 patients with various gynecological pathologies were treated. The operating unit is equipped with a laparoscopic technical kit from Karl Storz. Several types of gynecological operations are performed by laparoscopic (Fig. 1, a) and vaginal accesses, as well as intrauterine surgery using a hysteroscope and a hysteroscopes (Fig. 1, b).

In this work the clinical, analytical and statistical methods of investigation were used. The analysis of the case histories was carried out, the somatic and reproductive history, the structure of the performed gynecological operations and their outcomes are studied.

All procedures performed in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration. No animal or human studies were carried out by the authors

for this article. Data are anonymous and will be used for research purposes.

Analysis revealed that 77 (92.8%) of the 83 hospitalized patients are residents of Almaty, 5 patients (6.0%) are residents of Almaty and Zhambyl regions, 1 (1.2%) is from Astana. Patients from Almaty were hospitalized in the direction of polyclinic of the city hospital No. 5 – 47 (56.6%) hospitalizations, the city polyclinic CP No.12 – 10 (12%) hospitalizations; CP No 4 – 6 (7.2%); CP No. 3, 15 and 17 – 5 (6.0%); CP No. 6, 11, 16, 21 – 4 (4,8%).

Analysis of social indicators revealed that housewives were 46 (55.4%), retirement age – 6 (7.2%), working women – 31 (37.4%). The ethnic composition was studied: Kazakhs – 76 (91%), Russians – 3 (4%), Uighurs – 3 (4%), Korean – 1 (1.2%). The age of women ranged from 18 to 70 years. The number of women of active reproductive age was 45 (54.2%), late reproductive age – 22 (26.5%), in perimenopause, postmenopause – 16 (19.3%).

The average length of stay of patients in the gynecological department for 2015 – 2016 was  $5.0 \pm 0.5$  bed-days.

#### Results of the research and their discussion

The structure of the indications for hospitalization of patients in the gynecology department is shown in Fig. 2. For 2015-2016 years, 83 patients were hospitalized on the state order and 93 gynecological operations were performed. 10 (12.0%) of 83 patients underwent simultaneous operations (hysteroscopy and laparoscopy). Table 1 shows the structure of diseases of patients

by year – in 2015 and 2016. 40 of 83 patients have previous long-term infertility. Every fifth patient was hospitalized with a diagnosis of infertility of mixed genesis, each tenth – with tubal-peritoneal infertility. The second place is occupied by benign neoplasms of the ovaries, including endometriosis cysts. Among the hysteroscopic operations, the operations of endometrial and cervical polypectomy, endometrial biopsy prevail. All of them were accompanied by fractional diagnostic scraping of the uterine cavity and cervical canal. In addition to specialized medical care (SMC), the sanatorium provides high-tech medical services (HTMS) concerning uterine prolapse and stress incontinence (Table 1).

The analysis of the surgical treatment for 2015-2016 has revealed that operations were performed laparoscopically in 25 (26.9%) cas-

es, in 58 (62.4%) – hysteroscopically and in 10 (10.7%) – by vaginal access. The structure of gynecological operations was as follows: in 2015, 54 surgical procedures to 51 patients were made, in 2016 – 39 manipulations to 32 patients. Table 2 shows the types and number of intrauterine manipulations for 2015-2016.

In the structure of laparoscopic operations (Table 3), the leading steels of cystectomy (10 operations) and salpingo-ovariolysis (7 operations).

In 2015, more operative interventions were performed by vaginal access (in the framework of HTMS): anterior and posterior colpotomy, colporrhaphy with bladder transposition, Kelly's cystourethropexy – 8 operations, hysterectomy without appendages – 1, extirpation of the cervix stump – 1.

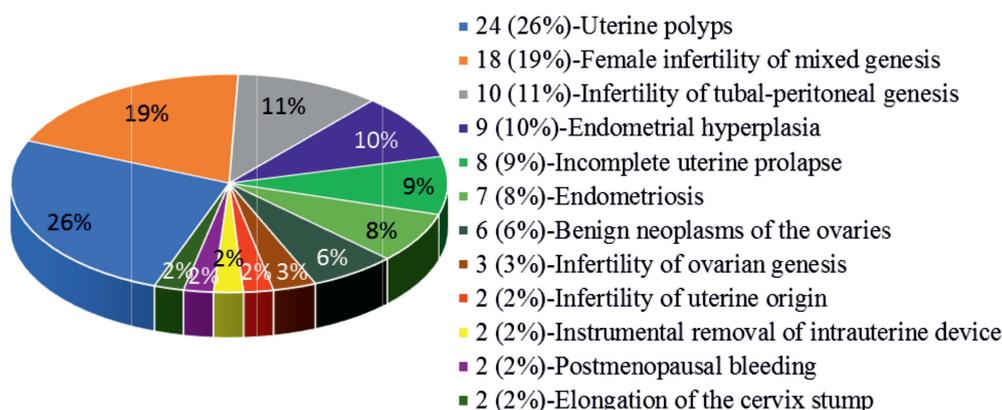


Fig. 2. Structure of diseases of hospitalized patients

Table 1

Statistics and the number of patients treated in 2015-2016 on nosologies

Type MC	Nosology ICD-10	2015		2016	
		Quantity	%	Quantity	%
SMC	Female infertility of mixed genesis	11	20.4	7	17.9
	Infertility of tubal-peritoneal genesis	6	11.1	4	10.3
	Endometriosis (infertility)	4	7.4	3	7.7
	Benign neoplasms of the ovaries	4	7.4	2	5.1
	Infertility of ovarian genesis	2	3.7	1	2.6
	Infertility of uterine origin	2	3.7	–	–
	Endometrial hyperplasia	2	3.7	7	17.9
	Uterine polyps	13	24.1	11	28.2
	Postmenopausal bleeding	–	–	2	5.1
	Instrumental removal of intrauterine device	2	3.7	–	–
HTMS	Uterine prolapse	7	12.9	1	2.6
	Extirpation of cervix stump, hysterectomy	1	1.9	1	2.6
Total surgical procedures		54	100	39	100

Table 2

Structure of intrauterine manipulation for 2015-2016

Types of intrauterine manipulation	2015		2016	
	Quantity	%	Quantity	%
Diagnostic hysteroscopy	5	13.8	3	13.6
Polypectomy	13	36.1	9	40.9
Scraping the uterine cavity	13	36.1	9	40.9
Removal of the intrauterine device	2	5.6	–	–
Dissection of synechia (hysteroscopy)	1	2.8	1	4.6
Uterine septum dissection (hysteroscopy)	2	5.6	–	–
Total:	36	100	22	100

Table 3

Structure of laparoscopic operations for 2015-2016

Types of laparoscopic operations	2015		2016	
	Quantity	%	Quantity	%
Salpingo-ovariolysis, adhesiolysis	2	14.3	5	45.4
Cystectomy	6	42.9	4	36.4
Fimbrioplasty	–	–	1	9.1
Ovarian drilling	2	14.3	1	9.1
Adnexectomy	1	7.1	–	–
Myomectomy	3	21.4	–	–
Total:	14	100	11	100

The results of treatment of patients with various gynecological pathologies are characterized by the absence of relapses of genital prolapse, benign neoplasms of the ovaries and the uterus, and the absence of complications in the postoperative period.

The experimental introduction and expansion of the list of free medical services within the framework of GVFMC into the medical practice of sanatorium allowed "Okzhetpes" "Almaty" JSC to provide surgical assistance to socially vulnerable segments of the female population with impaired reproductive function, as well as to significantly shorten the period of their rehabilitation and improve the outcomes of surgical treatment. Long-term results indicate early restoration of fertility after surgical treatment in 8 (20.0%) of 40 patients with previous long-term infertility: in 6 (15%) patients the pregnancy ended by vaginal parturition; in 1 (2.5%) – by a planned cesarean section, and 1 (2.5%) is now in pregnant.

Women from socially vulnerable segments of the population note an improvement in the subjective evaluation of the quality of life as a special effect of the treatment received in the highly comfortable conditions of the sanatorium.

### Conclusion

The experimental introduction of hysteroscopy, hysteroscopy, laparoscopy and vaginal surgery in comfortable sanatorium allowed to significantly shorten the rehabilitation period, contributed to the early restoration of fertility and the onset of pregnancy in 20% of patients with previous long infertility caused by infertility of mixed genesis, infertility of tubal-peritoneal genesis, endometriosis, infertility of ovarian genesis, infertility of uterine origin. Women from socially vulnerable segments of population note an improvement in subjective evaluation of life quality. The results obtained allow projecting this experience on similar medical institutions of sanatorium-resort type.

Authors are grateful to Amanzholova B.K. for the discussion of the manuscript, to Shaimardanova L.K. and other doctors for assistance in referring patients to the clinic.

The authors declare no conflict of interest.

This research received no specific grant from any funding agency in the public, commercial, or from non-profit sectors.

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## EFFECT OF INCREASED RADIOACTIVE BACKGROUND ON QUALITY OF LIFE OF HEALTHY RESIDENTS IN MAILU-SUU AND CHRONIC OBSTRUCTIVE PULMONARY DISEASE PATIENTS

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The work was aimed at assessing the impact of increased radioactive background quality of life (QOL) of healthy residents of working age and patients with COPD living in Mailu-Suu, in the vicinity of which are located powerful uranium tailings. A survey was conducted on the MOS SF36 questionnaire and a clinical and functional examination of 70 employees of the electric-lamp factory (30 men and 40 women) and 42 patients with COPD with stage 1–3 disease registered in the FMC. Revealed a moderate decrease in some of the indicators of QOL in healthy workers and a significant decrease in patients with COPD, depending on the stage of the disease. The degree of decline in physical activity and general health directly and strongly correlated with lower indices of respiratory function, indicating an existing bronchial obstruction, which may be due to the pathogenic effect of environmental factors.

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**Keywords:** Radiation, COPD, respiratory function, quality of life

It is known that working with uranium ore leads to the development of chronic obstructive pulmonary disease, lung cancer, and less often other localization of cancer [13]. The predominant lesion of the lungs is due to the high radon content in uranium mines, concentration plants, and near the tailings of radioactive waste. In France and Germany, a cross-analysis of the causes of death of each worker in the uranium production from 1946 to 1990 was conducted, and a significantly higher mortality rate from lung cancer was found in comparison with the whole country [13, 14]. Therefore, monitoring the health of residents of areas with high radioactive background is an important public health task.

Kyrgyzstan is one of the environmentally hazardous regions of the planet, on its relatively small area – 199.9 thousand km<sup>2</sup>, with a population of 5.12 million people, there are 49 uranium tailings and 80 dumps of rocks, where 70 million m<sup>3</sup> of uranium waste is buried [4]. The city of Mailu-Suu is located in a geochemical province with an increased radioactive background, in its vicinity there are the largest radioactive waste tailings in Central Asia, affecting the inhabitants living there [2, 3]. Earlier, scientists of Kyrgyzstan showed a high incidence of detection of chronic obstructive pulmonary disease (COPD) and lung cancer in local residents [6]. Laboratory studies, even in relatively healthy individuals living near the tailings of the uranium production, revealed significant violations of local cellular and molecular defense mechanisms [5, 15]. Similar changes have been identified in other provinces with an increased radioactive background [11].

Assessment of life's quality (ALQ) using questionnaires allows you to reliably quantify health in comparable population groups, both healthy people and patients with various chronic diseases, including COPD [8, 9, 10]. It is known that radiation adversely affects QOL [7].

In Kyrgyzstan, a number of studies have been published on the assessment of the quality of life in a particular pathology, however, especially for residents of areas with an elevated radioactive background, QL was not investigated.

The aim of the study was to study the quality of life of healthy residents of Mailu-Suu and patients with COPD in comparison with the clinical and functional examination.

### Materials and research methods

Employees of the Mailusu Electrolamp Plant were examined for 40 women and 30 men of working age from 20 to 60 years, with an average age of 38.7 years. At the time of the survey (summer period), all workers were healthy. Of concomitant diseases, 8 people had a history of gastrointestinal pathology (chronic gastritis, cholecystitis), 5 had chronic bronchitis (all smokers), 3 had hypertension, 4 had gynecological pathology, 3 had urological pathology.

Also, 43 patients with COPD were surveyed – residents of Mailu-Suu in the stage of incomplete remission (summer period) under our supervision. Of these, 17 patients – with stage I, 16 – with stage II, and 10 – with stage III COPD (according to GOLD criteria, 2003).

The following research methods were applied:

- 1) Standard general clinical examination.
- 2) Study of respiratory function on the device Spirolan (Russia). FER was estimated by FEV1 – forced expiratory volume in the first

second, FVC – forced vital capacity of the lungs, PIC – peak expiratory flow rate. There was a frequency of violations of respiratory function as a percentage of the number surveyed.

3) Evaluation of QOL according to the general questionnaire of health – Medical Outcomes Study – Short Form (MOS SF-36). This questionnaire contains 36 questions covering 8 basic health characteristics.

The criteria for QOL for SF-36 are:

1. Physical activity (PA).
2. The role of physical problems in the limitation of vital activity (RF).
3. Pain (P).
4. General health (GH).
5. Social activity (SA).
6. The role of emotional problems in the limitation of vital activity (RE).
7. Mental Health (MH).
8. Comparison of well-being with the previous year (WB). By all measures the point of stability is 60.

The standards for QOL indicators for residents of the Kyrgyz Republic are 250 healthy respondents in Bishkek.

Statistical processing of research results was performed using generally accepted methods of variation and non-parametric statistics. We use Microsoft Excel, SPSS (“Statistic for Windows”) programs. Differences between the compared values were considered statistically significant at a significance level of  $p < 0.05$ .

**Research results and discussion**

Employees of the Maylisu electric lamp plant had a respiratory function close to those

characteristic of their age, sex, anthropometric type. Weakly marked disorders of respiratory function occurred with a frequency of 5.5–9.7%, mainly in male smokers (table 1).

In patients with COPD in the stage of incomplete remission, violations of the respiratory function were significantly more frequent. At the same time, the severity of violations of bronchial patency was greater than in healthy workers of MELZ (Table 2). Moderately and strongly marked disorders were observed only in patients with COPD.

Most of the indicators of QOL in healthy workers of the Mailu Suu electric lamp factory were slightly different from the age norm (figure).

At the same time, all indicators of QOL tended to decrease, but only PA, WB and GH were significantly lower (-7.4%, -6.0%, -7.9%, respectively). Sanitary and hygienic production conditions complied with the requirements in Kyrgyzstan. Wages allowed to feel confident, and therefore the indicators of ER and PZ did not differ significantly from the respondents in Bishkek.

In patients with COPD, the parameters of QOL depended on the stage of the disease. It is known that COPD is a continuously progressive disease.

At the first stage of COPD, the indicators of QOL were 10–15% lower than those of able-bodied residents living in the same area and exceeded stability points by 60%. This allowed them to lead a relatively free lifestyle, to work, not to feel bad in social and family life, to assess their emotional and psychological capabilities accordingly. Similar judgments are published by Russian scientists [1, 11].

**Table 1**

Frequency of detected violations of respiratory function (%) among workers of MELF and patients with COPD

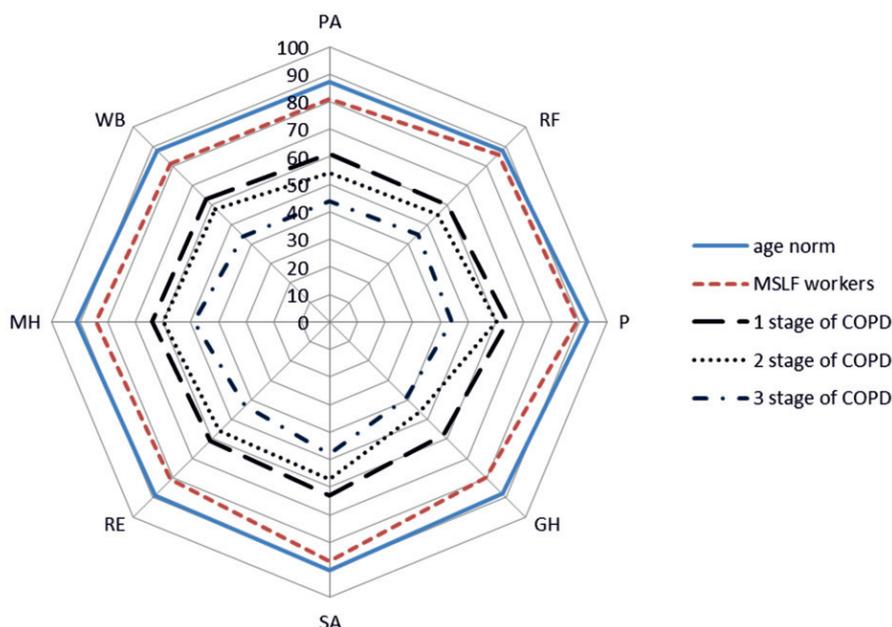
Group	FVC	FEV1	POS
COPD	17,3 ± 2,5 *	16,9 ± 2,5 *	25,8 ± 3,4*
Employees MELF	9,7 ± 3,0	5,5 ± 2,8	7,5 ± 3,4

Note: \* – criterion of reliability of differences with a group of healthy individuals  $p < 0.05$ .

**Table 2**

Frequency of decrease in FEV1 (% of due) in workers of MELF and patients with COPD

Group	FEV1 (% of due)				
	>80	80-70	70-60	60-50	<50
COPD	82,4 ± 3,8	10,5 ± 2,9	2,8 ± 1,1	1,7 ± 1,1	1,2 ± 1,1
Employees MELF	93,5 ± 2,6	5,5 ± 2,8	0	0	0



Indicators of quality of life among residents of Mailu-Suu

In the second stage of COPD, QOL was below the stability point of 60%. apart from pain, the decline was due to malaise due to respiratory symptoms (despite a stable summer period for them), physical activity and limited mobility due to shortness of breath and the psychosocial effects of the disease (90% of them were not engaged in production and business).

At the third stage of COPD, residents of Mailu-Suu had pronounced restrictions on QOL, ranging from 43 to 54%, sometimes half the age norm.

The degree of decline in the levels of PA, OZ directly and strongly correlated with lower rates of LF, indicating an existing bronchial obstruction, which may be due to the pathogenic effect of environmental factors.

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## THE WAYS AND MODELS OF NUMERALS-BASED WORD-FORMATION IN MODERN ENGLISH

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This paper is devoted to the current problem of ways of word formation in modern English based on the material of new formations using numerals. The study of this problem is important not only in terms of the word-forming capabilities of numerals in English, but also in terms of determining their structural and semantic features. This paper offers detailed consideration of the structural differences of words formed using numerals, in particular, specific methods, schemes and models of numerals-based word-formation, as well as their semantic features. When studying the formation of various parts of speech using numerals, we identified the following parts of speech: nouns, adjectives, adverbs, pronouns and verbs. And this paper, in particular, is focusing more specifically on nouns formed using numerals in modern English, as they are the most frequent and common. The system of new words formation using numerals was considered in the schemes and models of such words depending on the way of their formation. The content of this paper is built strictly on the principle of consistency in the description of each way of nouns word-formation based on numerals: scheme → model → semantic classes of nouns. In modern English, as in many languages of other types, the problem of classifying the ways and techniques of word-formation has not yet been solved. This paper considers one of the most productive ways of forming the latter, based on cardinal and ordinal numerals.

**Keywords:** numerals, word-formation, way, method, model, classification, nouns, affixation, suffix, structure, semantics

In the present-day linguistics, a various number of word-formation ways is distinguished even within the individual languages, which are designated by different terms. And commonly, some word-formation ways are specified in one classification and are missing in another.

It appears that classification of word-formation ways in modern English is problematic due to the fact that the linguists are using different criteria and principles to solve it, and because this problem was not the object of independent research.

The most complete classification of word-formation ways, which we mainly follow, is found in the works by N.M. Shansky, dedicated to Russian word-formation [1]. He distinguishes four main ways of word-formation: lexical-semantic, morphological-syntactic, lexical-syntactic and morphological. In the latter, he distinguishes such independent ways as: affixation, addition, non-affixal way, abbreviation and back-formation. One may not agree with certain provisions of classification, but in general it is logical, consistent and quite complete.

The lexical-syntactic and morphological ways of forming new words are intrinsic to the numerals-based word-formation in modern English, as well as using other parts of speech. The most productive is the morphological way of word-formation, especially compounding and suffixation. Reduplication, conversion and abbreviation are less productive.

In the framework of this paper, the affixal way of nouns word-formation based on numerals in modern English will be considered.

Affixation, as a derivation method, when applied to the words with the numeral roots, is represented mainly by the suffixal way of word-formation.

Cases of prefixation and suffixal-prefixal way of word-formation method are quite rare.

The adjectives from ordinal numerals are formed by prefixation way according to the scheme **Pref. + Num.o → Adj.**

“Her activities in the piece movement spanned many years, from **pre-second** world war fight against fascism and throughout World war two.”

The Socialist February 9, 1978, p. 3.

The nouns from cardinal numerals are formed by suffixal-prefixal way according to the scheme: **Pref. + Num.c + Suff. → Noun.** This scheme is represented by only one non-productive model: **multy + Num.c + – air → Noun.** The nouns of “multimillionaire” type are formed according to this model.

“Is he a **multimillionaire**?” Yes, said Harvey. He is what you call a **multimillionaire**.”

R. Kipling, “Sea stories”, p.13.

Suffixation in the word-formation based on numerals is the most productive for the nouns formation.

The nouns derived from numerals are formed by the addition of word-building affixes of nouns to the numeral stems, mainly suffixes, according to the following schemes:

1. **Num.c + Suff. → Noun**

2. **Num.o + Suff. → Noun**

Suffixes not only create a new word, but also formulate the corresponding part of speech, giving the word a new structural meaning, namely the meaning of substantivization.

The nouns from cardinal numerals are formed according to the model **Num.c + Suff** → **Noun**. The suffix in this scheme can be represented by the following variants: **-er / -or, -ary, -aire, -ness, -fold, -ling, -ain, -s**.

**1a.** The nouns with the following meaning are formed from cardinal numerals using the suffix **-er**:

a) a person of a certain age, called the word-producing stem (**fifteeners and sixteeners**, colloq. “young persons of fifteen and sixteen years old, **forty-fiver**, colloq. “forty-five-year-old man);

b) banknotes with a denomination of as much basic monetary units as are denominated by word-forming stem (numeral) (**fiver**, colloq. “five dollar banknote, five pound banknote”).

The semantics of some nouns derived from numerals is revealed in the etymological analysis of these words, for example, the word **fifty-niner** “gold digger” was formed during the gold rush in California in 1849; the word **hundreder**, hist., means: a) “district bailiff”, b) “resident of the district, who is obliged to perform the functions of jury member” was formed from the meaning of the stem of noun **hundred**, historical, which designated the district of county with its own court (in England). The noun **hundred** can take the low-productive and limited suffix **-or (hundredor)** and even the suffix **-ary**, although the latter is involved mainly in the formation of adjectives only from the stems of nouns, with the same meaning as the word **hundreder**: **hundredor = hundredor = hundredary**.

**1b.** The nouns from the stems of cardinal numerals, using the suffix **-aire**, are formed, which denote the persons having such a sum of money, which is denominated by word-forming stem. For example, the word **millionaire** means “a person (man) having a million pounds sterling.”

“It’s so strong that sometimes I do have a tiny effect on the haughty **ten-thousandaires**.”  
S. Lewis, “Main street”, p. 66.

This suffix does not form nouns from the stems of ordinal numerals.

**1c.** The nouns from cardinal numerals, using the suffix **-ness**, are formed, which have the abstract meaning of “state”. Thus, the word **oneness** conveys such concepts as “singleness, exclusiveness, loneliness, commonness, sameness, oneness, single-mindedness”, etc.

“He did not know how to get understanding or lovingness or **oneness** or any of these things could not even imagine what they were.”

**J.B. Priestley, “Angel Pavement”, p. 15.**

The suffix **-ness**, as well as the suffix **-er**, is one of the most productive suffixes formed from nouns.

**1d.** The suffix **-fold** usually forms adjectives and adverbs from the stems of numerals, but it can also form the nouns of **twofold** type “two-story houses located at a short distance from each other.”

**1e.** The suffix **-ling** was formed from the word **ling** with the meaning – a) common heather”, b) “reed”, c) zool. “barracuda”, which is part of the system of full-valued words of the English language, which does not have its material meaning or real value, but only gives the derivative word some additional generalized meaning. (1) In combination with the stem of ordinal numeral, it forms a noun denoting a person or object that has the characteristic features of a group, the quantitative composition of which is denominated by the word-forming stem: **furling** – a) “quadruplet”, b) “quadruple double (in crystallization)”, as well as using this suffix, the nouns are formed from the ordinal numbers such as **firstling** «firstborn” according to the model: **Num.c + -ling** → **Noun**.

**1f.** Using the suffix **-ain** from the stems of cardinal numerals, the nouns with the same semantics are formed as using the suffix **-ling**: **sixain**, verse. “six-line stanza.”

It is interesting to note that along with the conversion of nouns into the category of suffixes, the reverse process is also observed, when the suffix of the numeral becomes a word-forming stem for derived nouns (denominatives). Thus, from the stem **-teen**, using the suffix **-s**, a full-noun “**teens**” was formed with the meaning: “teenage age from 13 to 19 years”.

“According to neighborhood legend when the younger Radley boy was in his **teens** he became acquainted with some of the Cunningham’s from old Sarum.”

Harper Lee, “To Kill a Mockingbird”, p. 21.

The same stem is found in the composition of compound-derivative noun **teenager** with the meaning: “teenager, boy or girl aged from 13 to 19 years.”

Model **Num.c + Suff. + Suff.** → **Noun** is represented by one variant: **Num.c + fold + ness** → **Noun (twofoldness** “doubleness, twoness”).

The scheme **Num.o + Suff.** → **Noun** is found in two models of ordinal number stems formed nouns.

1) **Num.o + -er** → **Noun**

According to this model, using the suffix **-er**, such words as **secondor** “the one who supports the resolution, candidature, etc.” are formed.

Using the suffix **-s**, the nouns are formed from cardinal and ordinal numerals according to two models:

a) **Num.c** + **-s** → **Noun** and b) **Num.o** + **-s** → **Noun**

According to model (a), the nouns denoting the following are formed:

1) Monetary units

(**fives** “five-rate shares”, **threes** “three-rate securities”).

2) Sports terms

(**fours** “professional sports competitions, four races”).

3) Items

(**twelves** “books in the format of the twelfth part of a sheet or page of such books”, **sixes** “candles that compose six pieces per pound”).

4) Numbers

(**thirties** “numbers from thirty to thirty nine”).

According to model (b), the nouns are formed with the meanings:

a) items

(**thirds** “goods of third order and low quality”, “third class (of any transport)”, **seconds** “goods of second order”, “coarse flour”, **firsts** “goods of first order and superior quality”, “best lumpy ore”, “concentrate”).

We find it necessary to note the peculiar features of the way of numerals formed nouns using the element **-s**:

**six** (num.) “six” **sixes** (noun) “candles that compose six pieces per pound, six interest-bearing securities.”

In this case, the element **-s** is not the end of the plural of nouns (purely grammatical morpheme), but the word formative suffix and lexical-grammatical morpheme, because it converts a word from the numerals category into the nouns category. This changes not only the structural meaning of the word as part of speech, but also its specific lexical meaning:

**eleven** (num.) “eleven” → **elevens** (noun) “light breakfast at eleven o’clock” (there is a phonetic variant with doubled **-s** (**elevenses**)).

But the element **-s** is not always a lexical-grammatical morpheme in the composition of noun derived from the numeral. In cases when there is a numeral formed noun using the conversion way, then from it, in turn, a new noun can be formed with a completely different lexical meaning using the element **-s**:

**five** (num.) “five” → **five** (noun) “five pound note” → **fives** (noun) “five fingers, one’s hand, five rate shares”.

**first** (num.) “first” → **first** (noun) “highest grade in English universities” → **firsts** (noun) “goods of first order and superior quality, best lumpy ore, concentrate”.

Also compare the following examples:

**four** (num.) “four” → **four** (noun) “grade four, four-oared boat” → **fours** (noun) “professional sports competitions, four races, four-rate shares or securities”.

**second** (num.) “second” → **second** (noun) “second-in-command, second grade, second-place team” → **seconds** (noun) “goods of second order, coarse flour”.

In these examples, the element **-s** is a lexical morpheme equal in function to the prefix, because it changes the word lexical meaning only, leaving it in the nouns category. Unfortunately, the function of the element **-s** in the word-formation from numerals in the English language has not yet been described or even noted.

Within the morphological way of word-formation, it is necessary to make distinction between the words formed in compound-suffixal way, where the addition of complete stems is accompanied by simultaneous addition of the suffix **-er** to form complex-derivative (according to the terminology by N.M. Shansky – compound-suffixal) nouns using numerals.

The addition of this nominal affix to the stems of compound nouns with numerals, wherein a complex distinctive feature of persons, objects or phenomena is embedded, leads to objectification of the meaning of the compound word as a whole, and the whole becomes the name of the carrier of this distinctive feature, for example:

**first-nighter** “frequenter, regular visitor of theater premieres”, **two-seater** “two-seat car or plane”, **two-pounder** “fish (usually trout) weighing two pounds”, **six-bedder** “bed with seats for six”, etc. The semantics of compound derivative nouns with numerals is quite diversified.

In modern English, the compound derivative nouns are formed using numerals in compound suffixal way according to the following four main schemes:

**I. Num. + Noun + -er** → **Noun**  
(two-seater “two-seat car”)

**II. Num. + verb + -er** → **Noun**  
(four-flusher, colloq. “cheater, trickster”)

**III. Num. + adj + -er** → **Noun**  
(one-aloner “lonely person, loner”)

**IV. Num.o + -s + Noun** → **Noun**  
(thirdsman “third party, intermediary”)

The major part of numerals-based nouns is formed in compound-suffixal way according to the following scheme:

**Num. + Noun + -er** → **Noun** two models are distinguished within this scheme:

a) **Num.c + Noun + -er** → **Noun**; and  
b) **Num.o + Noun + -er** → **Noun**

Frequency and productive model (a) forms compound derivative nouns denoting:

1) Means of transportation

(**three-wheeler** “three-wheel bicycle”, **two-seater** “two-seat car”, **four-seater** “four-seat car”), **four-wheeler**, colloq. “horse carriage”, **two-decker** “double-deck ship, double-deck bus”, **three-decker** “three-deck ship”, **three-master** “three-mast ship”.

2) Fire weapons and fire guns

(**four-pounder**, hist.: “four-pound bore cannon”, **six-pounder** “57 mm cannon, six-pound ball”, **sixty-pounder** “27 mm cannon”, **one-pounder** “one-pound bullet firing gun”).

3) Items the meaning of which is denominated in the last noun

(**one-actor** “one-act play”, **one-suiter** “small suitcase that can fit one costume and other minor items”, **three-plier** “three-bend rivet”, **one-sucker**, “crop of tobacco cultivated in western Kentucky in USA”, **four-poster** “four-post bed”, **three-volumer** “three-volume book”, **ten-pounder** “ten pound item, large-sized item”).

4) Monetary units

(**ten-center** “dime coin”)

5) People

(**hundred-percenter** 1. “all American, hurrah, boys! patriot”, 2. “man who is ready to stand to the end”, 3. “regular guy/ capital boy, great girl”, **six-footer**, colloq. “six-foot-tall man”).

6) Serve as military terms

(**three-stripper** “US navy commander”).

“Tom, I wouldn’t ever get into all this trouble if it hadn’t a fen for that money; now you just take my sheer of it along yours, and give me a **ten-center** sometimes.” M. Twain “The adventure of Tom Sawyer” p. 204.

“Oh, a **six-pounder** or two in case of emergency was the intrepidly indifferent reply, with a small stock of muskets, sealings, pears, and cutlasses, you know.”

H. Melville “Benito Cereno” p. 194.

“After half an hour’s waiting Dick almost weeping with rage and wrath, caught a passer – by who introduced him to a friendly policeman, who led him to a **four-wheeler** opposite the Albert Hall.”

R. Kipling “The Light That Failed” p. 208.

It should be noted that ambiguity is a characteristic of the cardinal numerals-based nouns using compound suffixal way, which makes it difficult to assign some of them to any particular semantic category. For example, the noun **ten-pounder** has 4 meanings: 1. “piece with a weight of ten pounds”, 2. “good at the cost of ten pounds”, 3. “ten pound note”, 4. “voter

with the income of ten pounds per annum”; the noun **three-decker** has 5 meanings: 1. “three-deck vessel”, 2. figurative sense “trilogy, three-volume novel”, 3. colloq. “three-layer sandwich”, 4. “man of giant strength”, 5. “thing of large size/ bulge”; the noun **hundred-percenter** has 3 meanings: 1. “all American, hurrah, boys! patriot”, 2. “man who is ready to stand to the end”, 3. “regular guy/ capital boy, great girl”; the noun **two-decker** has 2 meanings: 1. “double-deck ship”, 2. “double-deck bus or trolleybus”, etc.

The model **Num.o + Noun + -er** → **Noun** is less productive and frequent as compared to the previous model. According to this model, the nouns are formed using ordinal numerals that designate **people** and **objects** (**first-nighter** “frequent, regular visitor of theater premieres”, **second-rater** “mediocre and ordinary person”, **third-rater** colloq. “thirds”, third-best” (about people)), **fifth-former** “schoolboy of the fifth-class”, **first-grader** “first-year student”, **first-rater** sport “first-class yacht, ship”).

“He felt at that moment as light-hearted as a **fifth-former**.”

A. Murdoch “The Sand Castle” p. 161.

According to the scheme **Num + verb + -er** → **Noun**, compound-suffixal nouns are formed. The numeral serves as the first component, and the verb stem as the second. Two models are distinguished within this scheme: a) **Num.c + verb + -er** → **Noun** and b) **Num.o + verb + -er** → **Noun**. Both models are non-productive.

According to the first model (a), compound-suffixal nouns are formed using cardinal numerals of **four-flusher** type, American slang “cheater, trickster”, **six-shooter**, colloq. “six-chambered revolver, gun.”

“Mrs. Harry Haydock as the young lady from the west who so easily showed the New York **four-flushers** where they got off was a vision of loveliness and with five stage presence” S. Lewis “Main street” p. 229.

According to model (b), compound-suffixal nouns are formed using ordinal numerals of **first-offender** type “a person condemned for the first time.”

And finally, according to the scheme **Num.c + adj scheme. + -er** → **Noun**, the compound-suffixal nouns are formed, wherein the first its component is a cardinal numeral, and the second – adjective. This scheme is non-productive, it formed words like **one-aloner**, colloq. “absolutely lonely person, loner.”

The nouns formed using numerals according to compound-suffixal way are written with a hyphen and, basically, have a dibasic stress.

A.I. Smiritsky [2], when classifying compounds cites the words with a special connective morpheme (**statesman** “public official”, **tradespeople** “people of trade, merchants”) as the first of five types of compounds, however, until now, the formation of new words with connective morpheme **-s** based on numerals has not been noted in linguistic literature.

Compound suffixal nouns with connective morpheme **-s** with the numeral base are formed according to the scheme: **Num.o + -s + Noun → Noun**.

Nouns formed according to this scheme can be variants (**second-hand** = **secondshand** “clock’s second hand”) with other independent lexical units (**thirdsman** “third person, intermediary”). This scheme is non-productive.

Thus, in the modern English, affixation – is one of the most productive ways of nouns word-formation based on numerals. Nouns, which involve the numerals and which are formed by affixation method, are systematically organized in the English language, i.e. these nouns are forming according to certain structural models corresponding to the structural laws of word-formation.

These nouns are distinguished by a variety of structures and fine differentiation of meanings.

The largest number of such nouns is formed using cardinal and ordinal numerals of the first ten.

The nouns with the roots of the numerals basically preserve a semantic link with numerals. The most important feature of nouns with the roots of the numerals is their polysemy.

In the course of the study, it was found that the **-s** element in the numeral-based word-formation system has three functions, and this element can serve as lexical-grammatical morpheme (suffix), lexical (prefix) and connective morpheme (infix).

Word-formation models of English numerals that demonstrate affixal derivation give a complete basis to linguists to single out cardinal and ordinal numerals into particular morphological category of notional words [4].

The findings of study can be used in lexicography and in the classroom, especially when teaching special lexis and vocabulary (military, sports, music, accounting), as well as colloquial and everyday language.

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## CONCEPTUAL APPROACH TO STUDYING OF THE KYRGYZ LANGUAGE

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The various concepts of a concept "woman" in modern Kyrgyz literature is considered in this article. Are investigated a concept of a concept "Woman" of various genres of literature, namely: used in set phrases connected with the concept "woman", proverbs sayings about "woman", written and oral folk art, catchwords, etc. In this article are accurately and clearly described wisdom, beauty of the Kyrgyz women. The concept "the woman-mother" is given, the author defines a concept "woman" in traditions, customs, national trust, the Kyrgyz family, a social status. Also the author gives a concept of a concept "woman" in the advantage and a shortcoming of the Kyrgyz women. Thus the author gave the national maintenance of the concepts "woman". Therefore, there are all bases to conclude that the concept "woman" was investigated in various ways, namely – the family relation of women; through behavior of women – characteristic qualities which belong to mankind such as: wisdom, justice, skill, thrift, hospitality, purity. And if these human qualities were based universal general rules, and in the national maintenance of the concepts "woman" were proved that the woman has to become a mother; the woman in whom it is opened and all merits are shown, brings success, good luck, respect, abundance and prosperity.

**Keywords:** a concept, knowledge of the world by mankind, the saved-up value, the innovative idea, human mind, language units, the wife of the husband, spouse, the married woman, woman, etymology, writing, kunchuy, ebchy, yotuz, kishy, hatun

The concept is a set of information which is saved up with the help by knowledge of the world by mankind, the value which in other words is saved up the innovative idea, in human mind. Knowledge and experience exist in the form of a concept. All parties of a concept do not give a concept by means of language units. But the concepts which were engaged the place in human mind can verbalize by means of language. Concepts give a concept in various ways in language. Verbalization of only one concept can be carried out in various ways in literal, figurative or figurative sense. This problem is considered at the heart of a concept "Woman" in this article. This problem is analyzed at the heart of a concept "Woman" in this article.

#### 1. Interpretation the word "Woman" in the dictionary.

1) "woman"; 2) "wife of the husband, spouse" [9].

3) "wife, married woman, spouse, woman" [12].

#### 2. Etymology of the word "Woman".

Ayal iyal (عِيَال) – from Arab word, in translation are meant by "woman"; "the married woman", "spouse" [4].

In the Yenisei writing in value "married woman", "spouse" were used in words: *kunchuy, ebchi, yotuz, kishy* [12].

Meanings of the word "Woman" occur in the dictionary by Mahmoud Kashkari in words: *kishy, hatun, kunchuy*. The word "Woman" means – "the husband's wife", (*ol kişi aldımı – "Is he Married?"*), *katun* means "the wife of the khan", "the chief tsarevna / ruler", *kunchuy* means one degree below *hatun* in this dictionary [3].

**3. Similar on meaning to word "Woman" words:** *woman, wife, spouse, daughter-in-law.*

If from them the Arab word: *the woman* belongs to all functional stylistics of the Kyrgyz literature that name of words: *zaip* (turkish word), *katun* (farce word), *juban* (turkish word), *urgaachy* belong generally to colloquial, art style.

• And the word *katun* is used in phonetic changes: in the Kyrgyz, Kazakh,

Bashkir languages: *katun*; Uzbek: *hatin*, Turkmen: *kadyñ*, in *Khakas*: *hazyn*, *Uigur*: *hotun* i.e. change pronunciation. Word *Katun* in semantic change of modern Kyrgyz means roughly meaning.

#### 4. The peculiar name to the word "Woman":

• **On age features:** *a girl, a young lady, a daughter-in-law, a woman, a old woman, a baybiche – the respectful address to the elderly woman.*

• **Under the provision of a wedding:** *daughter-in-law, spouse, wife, tokol-second wife, woman, old woman, baybiche-respectful address to the elderly spouse.*

• **By related provisions:** *a mother, a mom, a daughter, a little sister, a sister, a tayeze – a sister*

on the maternal line, *a tayene – a grandmother on the maternal line, a mother-in-law, a sister-in-law, a kaynezhe – elder sister of the husband, a snoshenitsa* (the wife of the brother or the relative in relation to the wife of another brother or relative), *daughter-in-law, kudagiy* (marriage broker).

• **On a pregnancy position:** *pregnant woman, expectant mother, a woman is pregnant, toxemia* (at pregnant women), *woman in childbirth, woman recently confined.*

• **By a social status:** *the chairman, the woman – the director, the woman – the engineer, the woman – the deputy, the woman – the minister.*

● **On estimation of women:** *good woman, bad woman, economical woman, exhausted woman.*

#### 5 Language units with the word “Woman”:

● Derivative words:

– **LUU:** *ayalduu* – *he is married;*

– **LYK:** – *women’s.*

● Qualities peculiar to the word “Woman”:

– **ZAADA:** *ayalzaada* – *“contrast to men”, “woman”;*

– **MET:** *ayalmet* – *“family”, “having many children”;*

– **POZ:** *ayalpoz* – *“voluptuous”;* *“womanizer”, masher, lady-killer, Don Juan, philanderer.*

● **word-combination, phrase:** *clever woman, good woman, bad woman, beautiful woman, pregnant woman, infertile woman, female deputy, dissolute woman, fizgig, etc.*

#### 6. Proverbs – sayings about “woman”, catchwords:

*Better be the Men’s head of a frog than woman’s golden head.*

*A good husband makes a good wife.*

*A good Jack makes a good Jill.*

*Good wives and good plantations are made by good husbands.*

*A good yeoman makes a good wife.*

*Even an experienced person can err; blunder (said to excuse the mistakes or negligence of a person from whom such things are not expected) Most men believe their wife to be the best one.*

*Men cannot do without a wife.*

*The wife plays the decisive role in solving all the family problems. Husband and a wife are alike; they share similar interests and opinions.*

*Never interfere with family quarrels.*

*Put not your finger (hand) between the bark and the tree.*

*If my aunt had been a man, she’d have been my uncle [10].*

There are many proverbs and sayings about the woman in the Kyrgyz language. Their accenting part consist of qualitative features of women. Positive and negative estimates are determined by external and internal qualities of women in Kyrgyz proverbs and sayings. Estimates peculiar to internal qualities: *clever/stupid, economical / exhausted, quiet / thoughtless, sociable / unsociable and. etc.* Estimates which are estimated on external qualities: *beautiful, magnificent, strange, ugly, visible, picturesque, graceful, pretty, charming, attractive, charming. etc.*

#### 7. The used phraseological units connected with the concept “Woman”

The culture of the Kyrgyz women, their behavior, moral ethics, traditions and cus-

toms, etc. are reflected in phraseological units with the concept “Woman”, also such values as “wisdom of the Kyrgyz women”, “beauty of women”, “the woman – mother”, “customs and traditions”, “national belief”, “family”, “position of women”, “features of behavior of women” are reflected.

It is possible to separate and consider each subject separately.

● **Wisdom of the Kyrgyz women.** *“mind rich.”, “the best head”, “deep on mind”, etc.*

● **Beauty of women.** *Would call the beauty by the moon and she doesn’t have*

*those advantages, would call the sun and there is no that beauty; it is beautiful as the moon, as the sun; as moon and with eyes of a colt; with a small mouth and dark eyes tonkobrovyy, teeth as if pearls, a crane neck, a roe a neck, dark-haired, a clear forehead (sign of mind, charm, good nature) etc.*

● **The woman is mother.** *Pregnancy, she is pregnant, pregnant woman, be gone with the child, the woman is pregnant, he got her with child, eat for two, she is going to be mother, it has to be resolved soon, live on borrowed time, in the family way, one is in the last month of pregnancy, is near her time, to be big with child, be expecting, prospective mother, be pregnant, bear a child, expectant mother, to carry (a child) under one’s heart, to be with child, wear under my heart, one is in the last month of pregnancy, is in the (a) family way, is expecting, is with child, expectant mother, labor pains, pains, childbirth labor, she began having contractions. breast-feed, suckle, nurse, give suck, breast-feed, lactation, adopt, justification of maternal milk, to make something that mother was happy”, mother hasn’t forgiven (I have literally forgiven followed me for white milk), let milk of my breast will punish! (maternal damnation), I will damn a maternal oath, you to me will be not the daughter or not the son (literally I will refuse motherhood).” the woman who didn’t have children (literally. the woman at whom heels didn’t become covered with blood); “fruitless”.*

As are noticeable in phraseological units of Kyrgyz if the family had no children, then the wife was guilty and her called phraseological units “unfortunate”, “childless”; “fruitless”, etc. For example it is possible to tell Orozkul’s fate and Bekey in the story Ch. Aitmatov “The white steamship”: ... God has given many children to all and why hasn’t given her? ... He has no successor therefore he has become angry to the wife. She “fruitless” and therefore isn’t present happiness in this family!... [1].

**Traditions and customs.**

- *Achuu basar* – custom, “when the girl marries, matchmakers ask forgiveness from girl’s relatives and during acquaintance bring gifts”

- *Bash bayloo* – custom, “to become related through marriage of the children or relatives”

- *Kara kiyuu* – custom “put on black the woman mourning (the husband)”;

- *Karasyn aluu* – custom “to remove mourning; the woman mourning (the husband) removes the black mourning puts on another”.

- *Soyko saluu* – custom “to present earrings to the daughter-in-law”;

- *Sut aky* – custom “something valuable or money which is due for the daughter-in-law mother”.

**National trust.**

- Umay – (the mythical female being protecting babies; women and men

address him); *yes there will be on advantage what I have made* (literally not my hand, but a hand of my mother Umay, literal medicine of my mother Umay).

- *Bashy baylanuu* “the busy girl, i.e. can’t marry since it is affianced”.

- *The stone is heavy in the place of the falling – to the daughter-in-law speak. That she has taken the place only in family and that she was only for the husband eternally.* If the woman has been divorced, then only the woman was guilty, in the Kyrgyz national understanding there was only of women’s fault and said: “*The city crushed and only the woman has crushed*”; “*Happiness falls, the trouble approaches – said. – who in marriage will take you? also blamed this misfortune only women*”.

For example, the great writer Ch. Aitmatov in the story “White Steamship” through thinking and empathy of the child defines that the woman shouldn’t destroy family: – *Why they such kind why they feel sorry for Orozkul? He is very bad, is fool. Why they have let to be him here? And without him everything would be good*” [1].

**Family.**

- “*He has got a lash good*” – he has a good wife (literal sense.);

- “To open a door and to cross a threshold” – when the girl for the first time married.

**Female position**

- *Besh kokul* – “the young girl”;

- *full age girl, marriageable girl* – “grown wiser, matured”;

- *the bad woman, the small child* – “in family isn’t present the adult owner”, “in family there is no adult responsible”;

- *kara daly* – adult girl (17 – 18 years); “the girl who doesn’t marry”;

- *the widow in mourning* (literal sense a black turban);

- “the divorced woman”.

**Features of behavior of women**

- *Jabyлуу kara ingen* “is about the woman tolerant, hardy, respected for the people”;

- *Jukchul kara ingen* “not tired, the woman bearing all efforts”;

- *ayagy suyk* “bad behavior”, “the behavior is weak”, “the woman with easy virtue”.

**8. Semantics- cognitive signs of a concept “woman”**

- Wisdom of women

Kyrgyz, relying on objective life experience, have given appreciation for wisdom, mind, resourcefulness, ingenuity, resourcefulness of women. Always and everywhere deeply respected women. Such attitude of the Kyrgyz people towards women can be seen in folk art, proverbs sayings, fairy tales, heroic legends, epics, genealogies it is, also, possible to meet in bylinas in activity of the famous women from simple families. About an honourable role and the relations of women in society, about the related relations to relatives, about the female educational conclusion transferred, the Kyrgyz people, by means of thousand-year oral works from generation to generation. Heroines of national works such as Kanykey, Aychurek, Akyl Karachach, Aygyanysh, Kenzheke, Zhanyl Myrza, Kurmanzhan differed in wisdom, justice, resourcefulness, ingenuity, resourcefulness. Having all these qualities, natives of the people of the female clear head, had a resolute role in this society. In Kyrgyz national feelings consciousness there is an ancient concept “Woman – the adviser of the husband”. For example in the epos “Manas”, Kanykey having wisdom, vigilance, skill, vigor fights destiny, politicizes and sometimes exceeds the husband Manas. Here therefore the Kyrgyz people appreciate in family the good, clever wife as in a proverb: “The good wife and to the husband has no price” [7].

- **Beauty of women.** The concept “Beauty” – positive assessment, poyavivshy, a look and with feeling reason of mankind. “Beauty” – as positive esthetic assessment is expressed on the relation also to the man, the nature, architecture, to all natural beings who give pleasant feelings. Among them in many cases is expressed to women. To be worthy and to deserve to such positive assessment all external and internal qualities: internal human qualities, appearance, youth, clothes, accessories, behavior, a smile, communication, etc. all continuous have to be favorable.

● **As the concept “Beauty”, results from favorable feelings.** The Kyrgyz people in the close, pleasant, favourite daily life compared beauty of women. For example in metaphor meaning compared: – compared to the nature, bright images of a lip – she has a small mouth (in literal sense as thimble); as a thimble – the skillful needle woman; eyebrows compared – a pencil or a high rigid steppe grass, a thin eyebrow (the beauty’s epithet) or dark eyebrows; teeth compared on semi-precious stones i.e. on amber, on pearls – pearl teeth, white as pearls; compared growth (about the young girl, ) being easily and smoothly bent (in literal sense as gentle twig); the person was compared to a beam, the moon or the sun – it is beautiful as the moon, as the sun; similar moon; and with eyes of a colt; person as moon girl; radiant; ruddy; beautiful and nice; with the snow absolutely white; white-white as snow; the neck was compared to a rooster, a crane, white swan – a graceful neck (beauties); (beauty) with a graceful neck. crane neck (beauty’s epithet); and. etc.

● **The woman is Mother.** Kyrgyz obliged themselves to become parents, to bring up and adequately raise the children. To women that they became a mother, have wished the child and addressed – “I wish you the child!” For example in the epos “Manas” Koshoy to Kanykey gives a prayful parting word, blessing: “Yes let to be born the son!” But women, which not deliver a child are called: “fruitless” [7].

● **The place and role of women in family.** The place and a role of women in family are widely reflected in national creative works, works of art, catchwords, proverbs and sayings. For example, the following proverbs and catchwords let know that without women and the world dark, and the house gloomy where the woman, there and grace: *The good wife and to the husband has no price. The wife is good, and the husband is good. A good husband makes a good wife. A good Jack makes a good Jill. Good wives*

and good plantations are made by good husbands. A good yeoman makes a good wife.

● **Advantage and shortcomings of women.** In the national concept “good woman”, “the best woman”, “bad woman”, “cunning woman” are considered as a unit a substantial concept and pursues two aims: first reflect national moral valuable the main essential concepts, secondly compare two substantial concepts.

● As a result the priority of the good wife to be put on the first place and to be famous clever, wise, the skilled worker, the beautiful, economical woman. **Shortcomings of the**

**bad woman:** slow, slow-witted, slow-learning, not able to speak harmoniously and tactfully; awkward, twaddle, street-walker, slatternly, sluttish.

● National trust.

The man is estimated above, than the woman in the Kyrgyz national trust. To continue the relationship in family, in many cases parents dream of the son’s birth. If in family the son wasn’t born, then daughters were called Burul, Burulsun (Turn), Uulkan, Uulbubu (Sonny), Zhanyl (Be mistaken). etc., strongly trusting in signs and hoping that following surely to be born the son. Distances blessing: – “Yes, let to be born the son!”

Men were considered lucky in every respect, bringing happiness, bearing good luck, successful. In the people trust if in the responsible moment in way meet the woman, it is not fortunately if meet the man, it is fortunately. If business there begins a man, then any business will be successful. For example, if have bought the house, then the first the man, surely has to come etc..

“Zhukchul kara ingen” is a phraseological metaphor means tireless, ceaseless eternal, uninterrupted woman. The tireless, multiworking woman is estimated by the good woman. Never are condemned bad behavior of men, and women it is estimated with epithets a negative connotation: slatternly, airhead; “dissolute”, “windy”, “changeable”, “the woman with easy virtue”.

**In the Kyrgyz proverbs:**

After the death of the husband there is no respect for the wife;

*Better be the Men’s head of a frog than woman’s golden head;*

Short mind of women, though hair long;

If to give volition to the woman, then she also doesn’t recognize god;

The wife is considered the first enemy in family.

*That woman who is afraid of the husband is respected,* – these proverbs give the concept about some mental concept [10]. But such mental concepts about women it is impossible to consider as at heart the Kyrgyz people. Result of individual psychologism, otherwise, it is possible to understand the distinguishing general national attitude towards women, the reflecting psychology of some personal and individual relations.

**National contents of concepts of “Women”.**

Thus, there are all bases to conclude that the concept “Woman” was investigated in various ways, namely – *the family relation of women*; through behavior of women – characteristic qualities which belong to mankind

such as: *wisdom, justice, mastery, thrift, hospitality, purity*. And if these human qualities were based universal general rules, and in the national maintenance of concepts of “Women” were proved that the woman has *to become a mother*; the woman in whom is opened and all merits are shown, *brings success, good luck, respect, abundance and prosperity*.

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## THE CATEGORY OF VOICE AND ASPECT AND THEIR INTERACTION

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The English language continues to enrich itself with new forms and expressions as well as to supply and modify the existing ones. The voice and the aspect systems have not yet fully formed and are in the process of development. There are different opinions about the aspect category, some linguists consider, that the English language has the aspect category and some linguists deny the existence of this phenomenon. The voice category also has its own problematic questions, especially reflexive, reciprocal voices. If the voice is considered to be as the verb category it should be expressed by verbs, but not pronouns (oneself, each other and others). These categories are analyzed from the point of diachrony and synchrony. The article is devoted to the study of the category of voice and aspect and their interaction in English verbal system. The study also examines various approaches to determining these categories.

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**Keywords:** voice, subject, object, aspect, tense, semantic category, grammatical category, grammatical transformations, time relation

Any language is characterized by the presence of active and passive structures. Passive constructions in English in all temporary forms are used quite widely. The question of their number as well as their qualitative characteristic among linguists still remains relevant. Understanding the theoretical component of the passive constructions of the English language and their development becomes possible due to diachronic analysis. In modern linguistics there is no generally accepted definition of the category of voice. The construction of passive voice describes the whole process of a certain event from the observer's point of view and has a certain form of expression: the auxiliary verb *to be*, *-ed* and the preposition *by*.

R. Quirk, S. Greenbaum and D. Lich distinguish 4 types of basic verbal constructions and assign the voice construction to the fourth type (type D) [1, p. 64]. According to R. Quirk "voice is a grammatical category that allows you to consider an action in a sentence in two ways without any changes in the facts presented" [1].

F.F. Fortunatov, A.M. Peshkovsky and R.O. Jakobson consider the forms of voice in terms of the relation of the verbal action to its subject. A.A. Potebnya, A.A. Shakhmatov pay attention not only to the subject, but also to the object of the verbal construction.

If we consider the voice structure in terms of semantic-syntactic definition, then the nature of the relations in it is expressed not only by determining the semantic meaning of the units, but also through the functional interaction of various parts of speech in a sentence.

Considering this, A. I. Moiseev argues that the forms of the voice express different attitudes of the verbal action and its subject to the subject and the object.

The peculiarity of the voice along with other grammatical categories is determined not only at the morphological level, but the ways of its expression also affect syntax and vocabulary. In addition the complexity of the voice is also determined by the different degree of grammatization of various ways of expressing values. The voice in the English language also has a number of specific features.

B.A. Ilish says that "the voice expresses the nature of the relationship between the subject and the predicate, as well as the attitude of the action to the object, if there is one in the sentence" [2]. E.I. Korolev here focuses directly on the syntactic connection in the construction itself: "forms of voice express the same relationship between subject and object, but for each form of voice, subject and object are expressed by different parts of sentences" [3].

Thus, grammatical transformations in the voice structure occur not only at the level of the verb phrase, but also at the level of the sentence. In the verb phrase the passive structure is formed by adding the appropriate form of the auxiliary verb and the past tense participle of the main verb. At the sentence level the passive voice occurs due to the rearrangement of the parts of the sentence among themselves: the active subject becomes a passive agent, the active object becomes a passive subject. This position allows us to define the voice taking into account not only the semantic meaning of the units, but also the functional interaction of lexical units in the voice structure. Thus the voice can be characterized as a grammatical category, the verbal construction of which contains semantic-syntactic relations between the subject and the object of action.

Due to its ambiguity of use and meaning, there is a question about the presence of a passive voice in the Old English period. The category of voice in this period begins to form with the help of the auxiliary verbs *beon* and *weorjjan* and participle 2, the combination of which transmitted only the meanings of the passive action, as well as the meanings of the state [2, p. 122]. On the one hand, the presence in the sentence of a verb that has a passive form, the presence of a subject performing the action, as well as verb forms expressing the action, indicates the existence of a certain voice construction during this period. On the other hand, the free arrangement of the voice construction parts in the sentence, in which the verbs *béon* and *weorjjan* played the role of link, not auxiliary verb, and also the coordination of the verbal predicate with the subject in the case form and number indicate the presence of syntactic connection at the level of the sentence members, which means the independent functioning of the participle 2. Thus, the existence of the voice form in the Old English period seems to us weakly expressed and is only the basis for its further formation.

According to a number of scientists (Ilish: 2000; Smirnitsky: 2011, etc.), the voice structure in the Middle English period begins to be used much more often. This period is characterized by the final formation of analytical forms of voice structures, which have undergone significant changes in their functioning. The further development of the voice verb forms during this period leads to the loss of the meaning of *beon* and *weorjjan* as link-verbs and gains the meaning of the auxiliary verb. The verb *ben* becomes the main auxiliary verb. The participle 2 also used without a case ending and becomes unchangeable [2, p. 248–249]. During this period in the system of passive constructions the person who committed the action is often used with the preposition *by*, being finally fixed in the voice structure only by the end of the Middle English period.

In the New English period the forms of voice construction were fully defined. Relations between words cease to be expressed through the grammatical form of the noun. These changes in the subject lead to a change in the structure of impersonal relations. In the New English period the verb loses the category of a person and a number, therefore in impersonal sentences it becomes necessary to use the formally impersonal pronoun *it*. These changes also relate to the sphere of passive voice with an indirect object of action and with a direct object. Such a structure was preserved due to

the fact that in the Middle English period there was no strict word order in the voice structure and an indirect object could be at the beginning of the sentence [4, p. 203].

In the development of the English language there is a strict fixation of the word order which determines changes in the voice structure with indirect object as the subject [4]. The form of the object case is replaced by the form of the nominative case: *them* > *they*. Thus, in the New English period a passive voice is developed with a subject that expresses an indirect object of action.

The peculiarity of the voice construction along with other grammatical categories, is determined not only at the morphological level, but the ways of its expression also affect the sphere of syntax and vocabulary. In addition, the complexity of the voice category is also determined by the different degree of grammaticalization of various ways of expressing values.

The English language voice system also has a number of specific features. The question of their number as well as their qualitative characteristics among linguists remains relevant. For example, most researchers of English theoretical grammar (G. Sweet, A.I. Smirnitsky) distinguish only two voices in English: active and passive. H. Poutsma distinguishes another voice – the reflexive voice. Comparing the system of Greek grammar with the system of the English language he notes that the meaning of the middle voice in Greek is usually expressed in English by means of reflexive or more rarely reflexive pronouns. The authors of the textbook “Theoretical Grammar of Modern English” Kobrina N.A., Boldyrev N.N., Khud'yakov A.A. distinguish six voices.

B.A. Ilish notes that “passive meaning is also not rarely seen in verbs that dropped a reflexive pronoun and, therefore, became non-transitive” and identifies two more: reciprocal and middle voice [2].

From the point of view of some linguists (O. Jespersen, G. Vorontsova), the verbs *get* / *become* in the construction with Participle II are also passive. Haimovich and Rogovskaya argue that in such constructions *get* / *become* always retain their lexical meanings.

The aspect problem belongs to a rather complex and still unexplored linguistic category. The category of the English aspect remains the subject of controversy of linguists of various directions. The reason for this is the fact that in the Middle English period English lost the system of verb endings which makes difficult to search for the category of the aspect in English. The aspect in English according to

B.A. Ilish is formed in the New English period: “The difference in action in the Old English period was expressed using the “ze” prefix not regularly and they were not grammaticalized so that we could talk about the grammatical category of the aspect. In the Middle English period this difference was also lost” [2].

The Middle English period is also characterized by the usage of analytical passive forms for all times of the Indefinite group, the Perfect group as well as for the Infinitive.

The abundance of works on the aspect in English shows that the concept of an aspect is interpreted by many scientists in their own way. The authors differently define the aspect as well as its classification. Among the approaches are the following:

1) The category of the aspect is a semantic category (G.O. Curme, E. Krusinga, H. Poutsma, O. Dahl). O. Dahl says that “the aspect is a part of the semantics of the verb used to convey the duration of the action, its beginning, its end or its completeness” [5, 22].

2) This category is inseparable from the category of tense and is a part of the tense system of English verbs (L.S. Barkhudarov, G.N. Vorontsova, I.P. Ivanova, D. Shtelling);

3) A category of aspect is a grammatical category (T.A. Barabash, B.A. Ilish, L.L. Iofik, A.I. Smirnitsky, V.N. Yartsev);

4) This category does not exist in the English language since it cannot be expressed synthetically (A.V. Shirokova).

The Kazakhstan scientists Zh.G. Amirova and M.Sh. Musataeva define the aspect as “the category denoting the temporal flow of an action (limit or non-limit, progressiveness – development of action in time, repeatability, effectiveness, multiple, etc.), in relation to which the meaning of verb aspect (limited or unlimited action by the internal limit) is one of the aspectual meanings” [6].

The Encyclopedia of Language and Linguistics gives an aspect the following definition: “The term “aspect” is used both in a narrow sense when it is referred to grammatical categories that influence the structure of a situation or its vision by a speaker and in a broad sense when it also covers lexical and semantic categories related to classifications of situations (methods of action)” [7, 240].

The perfect forms take the most controversial position. They are considered both as forms of the perfect form and as a special category of temporal correlation, and as an opposition to the perfect / imperfect.

According to A.I. Smirnitsky [8], the category of perfect is neither one of tense, nor one

of aspect but a specific category different from both. He took the perfect to be a means of expressing the category of “time relation”.

The Continuous form has at least two semantic features – duration (the action is always in progress) and definiteness (the action is always limited to a definite point or period of time). In other words, the purpose of the Continuous form is to serve as a frame which makes the process of the action more concrete and isolated. The main use of Continuous form is to express a particular subtype of imperfect aspectuality.

B. Comrie gives a different interpretation of the aspect. According to him in English the verb form should be considered in two oppositions that cover the entire verb system. These are Progressive (expressed with the help of *to be* and the verb with *-ing*), non-Progressive, Perfect (verb *to have* and Participle II) and non-Perfect [9].

L.S. Barkhudarov defines an aspect as a grammatical category expressing the method of performing an action [10, 113]. The aspect is constituted by two oppositions: the non-durable (general) and durable which is expressed in the forms of Continuous. M.Y. Bloch indicates that the form of the Continuous aspect is marked and analytical.

The Infinitive combines the properties of the verb with those of the noun, as a result it serves as the verbal name of a process. It has the grammatical categories of voice, aspect and temporal correlation. Consequently, the categorical paradigm of the infinitive includes eight forms: the indefinite active, the continuous active, the perfect active, the perfect continuous active; the indefinite passive, the continuous passive, the perfect passive, the perfect continuous passive.

The continuous and perfect continuous passive can only be used occasionally, with a strong stylistic coloring. It is the indefinite infinitive that constitutes the head-form of the verbal paradigm.

Like the finite form of verb, the infinitive distinguishes the categories of aspect, voice, and temporal correlation.

The paradigm of the infinitive is determined by the semantic-syntactic properties of the process. If the process is intransitive, we cannot derive voice forms:

to run	– to be running	vs.	to be being run
to have run	– to have been running	vs.	to have been being run

Thus, having studied the theoretical component of the voice construction and different approaches to its description, we characterized the voice as a grammatical category, the verbal construction of which contains semantic-syntactic relations between the subject and the object of action. These relationships are characteristic of many languages of the world. The voice constructions of the English language system include the morphologically initial form of the active voice and differ from each other in the composition of morphologically derived forms. In comparison with the active voice in modern English there is a passive voice showing that the verb-predicate action is directed at the person or object expressed by the subject, and the reflexive voice. The forms of the passive voice and the modern forms of the reflexive voice, which arose in the early New England period are analytic according to the historical context. The first is a combination of the auxiliary verb to be with participle II, the second is a combination of a verb with a reflexive pronoun in its function. Together with the reflexive voice there are also middle and reciprocal voices.

Along with the voice system there is also an aspect system. The aspect belongs to a rather complex and still unexplored linguistic category. Many questions remain controversial concerning the universality and language specificity. Having examined each of English tenses in order to identify the category of the

aspect we can summarize the following result. The aspect is a special grammatical category which characterizes the action according to the character of the flow of an action in time: continuous and perfect forms.

The results of the study showed that a characteristic feature of the English verb system has the close connection between categories of voice, aspect and tense. Moreover, the correlation of the tense and aspect plays an important role in determining the category of the aspect in English.

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**THE FUNCTIONAL SIGNIFICANCE OF METAPHORS  
IN THE WORKS BY OSCAR WILDE – “AN IDEAL HUSBAND”,  
“A WOMAN OF NO IMPORTANCE”, “LADY WINDERMERE”’S FAN”,  
“THE IMPORTANCE OF BEING EARNEST”**

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Metaphor is one of the ways of knowing the world. It is an integral part of the language. From ancient times to the present day, it has attracted a lot of attention as an object of scientific study. Currently, the metaphor is increasingly studied in the framework of cognitive linguistics, psycholinguistics, linguistic and cultural studies, and other frontier sciences. The article presents the analysis of literary significance of metaphors in the cognitive linguistics, and identified the metaphors' types and functions, based on Oscar Wilde's comedies "A woman of no importance", "Lady Windermere's Fan", "The Importance of Being Earnest", "An Ideal Husband". In the comedy by O. Wilde "An Ideal Husband", "A Woman Of No Importance", "Lady Windermere's Fan", "The Importance Of Being Earnest" the metaphor, along with a comparison, is a major, systematically applied stylistic mean. Metaphors are in every act of comedies, and often they are the basis of the artistic image.

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**Keywords: metaphor, functions of metaphor, stylistic means, approach, types of metaphors**

Metaphor is the most commonly used figure of speech in everyday language. Earlier metaphor was viewed as means of creating imagery of language, stylistic device, a way to "illustrate" the speech. However, in recent years the study of metaphors has moved to a new level. The number of works on this subject has dramatically increased that can be attributed to new prospects for consideration of the metaphor not only as an element of the language, but also as a reflection and result of thinking processes. Currently, the metaphor is increasingly studied in the framework of cognitive linguistics, psycholinguistics, linguistic and cultural studies, and other frontier sciences. This article is devoted to the study of metaphors in the comedies of Oscar Wilde – "A Woman Of No Importance", "Lady Windermere's Fan", "An Ideal Husband", "The Importance Of Being Earnest".

Metaphor is a kind of trail, which consists in transferring the values of similarity. The metaphor always connects simultaneously two meanings: one that is determined by the context, and the other, which is determined by the usual definition of the word that is specific to it devoid of context [1 P. 151]. Metaphor is often called "the reduced comparison" because metaphor as one word connects both the image and the object in question. The distinguishing peculiarity of metaphor is absence of a sign, by which the convergence between the subject and the image is made, it is necessary to guess this sign [2 P. 35]. This need to guess, i.e. to show some activity of perception, makes metaphor stronger stylistic means than comparison. In comparison, too, sometimes there is no a sign, and it is necessary to guess this comparison, but the object and image are not aligned. Meet-

ing the metaphor, the reader should understand the relationship between the subject and image to determine what is common between them, what is the sign applies to both the object and the image [3 P. 281].

Currently, there are many approaches to the study of metaphors. This diversity entails the birth of a plurality of classifications. Other researchers identify different types of metaphors, relying on its own approaches and criteria (Fig. 1).

In this article, we use the traditional classification of metaphors which involves the following types:

1. sharp metaphor is a metaphor that separates different concepts.
2. dead metaphor is a common metaphor the figurative character of which is no longer recognized.
3. metaphor-formula is similar to dead metaphor but differs from it by even more stereotype and sometimes impossibility to convert to nonfigurative construction.
4. extended metaphor is a metaphor being implemented consistently over a large fragment of the message  
or the entire message as a whole.
5. realized metaphor involves handling metaphorical expression without regard to its figurative nature, that is, as if the metaphor has a direct meaning. The result of the implementation of the metaphor is often comic [1], [13] and [15].

Also, it should be noted that a certain kind of metaphor performs a specific function in the text. Currently, the issue of functioning metaphors in the language communication system remains open subject for the study and, accordingly, various scientists emphasize a great

variety of metaphor spheres in a language. In our article we will use the following metaphor function hierarchy by V.K. Kharchenko:

- nominative (metaphor in titles)
- informative (features of the metaphorical information)
  - mnemonic (quick information memorizing)
  - style-forming (formation of certain styles)
  - text-forming (metaphors' ability to be explained)
  - genre-forming (creation of various genres)
  - heuristic (study of search functions)
  - explanatory (easy assimilation of complex information)
    - emotionally – estimated (means of influencing the addressee)
      - autosuggestive,
      - encoding,
      - conspiring (sense securing)
      - play (one of the techniques of creating the comic)
        - ritual (metaphors in greetings, congratulations, etc.) [2 P.30], [8 P. 112].

In the comedy by O. Wilde "An Ideal Husband", "A Woman Of No Importance", "Lady Windermere's Fan", "The Importance Of Being Earnest" the metaphor, along with a comparison, is a major, systematically applied stylistic mean. Metaphors are in every act of comedies, and often they are the basis of the artistic image. With the help of metaphors the author reinterprets the reality, reveals the hidden meaning of things and relationships, and encouraging the

reader to an active perception, makes him go through the same path of knowledge.

Let's note, first, cases where a metaphor is an epithet; such an epithet is called metaphorical. This category includes part of epithets. For example: "charming place", "suitable person", "odd trick", "beautiful nature", "beautiful moon", "domestic creatures", "dry goods", "magic lantern", "silliest word", "popular idea", "civilized body", "vulgar habit", "serious thing", "intellectual helpmate", "breathing space", "monstrous tie", "promissory note", "a very strong chin", "a square chin", "happy marriages", "picturesque protests", "common sense", "clever talk", "perfect angel", "hideous smile", "metallic problems", "perfect martyr", "London dinner-table", "fascinatingly willful sex", "nice pulpit", "gigantic intellects", "fatal thing", "wrong time", "wrong people", "wonderful piece of good luck", "guilty thing", "a most unfortunate case", "the wicked society", "the best auspices", "solemn moment", "bad headache", "pleasant scandals", "fresh waters", "democratic days" [20 P. 85-157], [21 P. 30-87], [22 P. 57-125].

These metaphorical epithets can be considered deleted, constant. These epithets perform **nominative** (lies in the possibility of developing the word figurative meanings), **informative** (is realized in the metaphors' ability to transfer information creating a holistic, panoramic image) and **mnemonic** (lies in the fact that the metaphor contributes to a better memorization of information) **functions** [4 P. 81], [5 P.52], [6 P. 78].

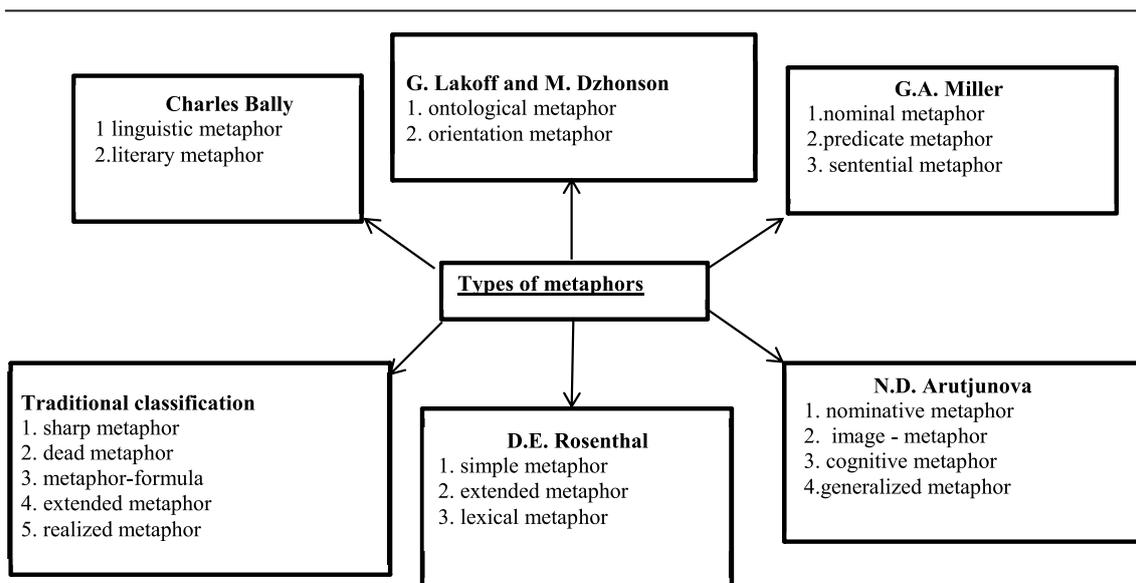


Fig. 1. Classification of metaphors

Since in our work, we are based on the traditional classification of metaphors, metaphors function in the text will also be considered from the perspective of this classification.

The first type of metaphors in the traditional classification is a harsh metaphor. We consider the examples of this metaphor and thus functions it performs on the material of comedies we have chosen:

- Lady Basildon: Men are grossly material, grossly material [20 P. 57]!

In this case, here is the harsh metaphor “*glossy material*”. This metaphor performs functions such as **play** (since gives a certain irony, comedy to the sentence), **emotionally-estimated** (there is a subject assessment and negative emotions) and **conspiring** (with the help of this metaphor there is classifying the general meaning of the utterance) [7 P. 107].

- Lady Chiltern: ... And money that comes from a tainted source is a degradation. Power? But power is nothing in itself [21 P. 61].

In this sentence, a sharp metaphor of “money is a degradation” emotional -estimated function (carries a negative assessment), mnemonic (as using this metaphor storing information occurs quite easily), moreover, the metaphor can serve to the formation of a certain slogan, quote, logo, etc.) and conspiring (there is classifying the true meaning of statements).

- Lady Markby: ... Mine (husband) is the general rule, and nothing ages a woman so rapidly as having married the general rule [22 P. 81].

Here the metaphor “the general rule” realize functions such as **play** (present comic tone), **encoding** (there is a subject of classification) and **emotionally-estimated** (since there is evaluation and emotion in saying).

Lady Bracknell : ... You can hardly imagine that I and Lord Bracknell would dream of allowing our only daughter- a girl brought up with the utmost care- to marry into a cloak-room, and form an alliance with a parcel [20 P. 31]? In this example, we clearly see a sharp metaphor of “a cloak- room” and “*a parcel*”. Presented metaphors perform such functions as encoding (subject of classification), **nominative** (development in the word figurative meaning), play (presences of irony, comic) and emotionally – estimated (presence of negative emotions and consequently evaluation)

Cecil Graham: Here you are going to be married again; thought you are tired of that game. [ 22 P. 33] In this case, a sharp metaphor of “game” bears the features such as the **nominative** (there is figurative meaning of a word), **emotionally – estimated** and **conspiring** (there is sense of classification statements).

Mrs. Allonby: All men are married women’s property. That is the only true definition of what married women’s property really is. [21 P. 34] Presented metaphor in this example, “women’s property” carries out such functions as **conspiring, emotionally – estimated, nominative, mnemonic**.

Thus, considered from the perspective of a sharp metaphor fulfillment of certain functions in the text it should be noted that most of the metaphor performs functions such as:

- **nominative**: since in most cases the contact facing away from each other leads to the development of concepts in the word figurative meanings, thus enriching the vocabulary of the text.

- **emotionally – estimated**: from the metaphor theory and also according to the examples given in the work becomes apparent, that a sharp metaphor adds text field, sometimes taunts, which leads to the emergence of emotions in replicas of heroes and as a result contributes to the appearance of some estimates.

- **play**: it is quite common if such a function, which is due to the previously mentioned taunts and sharpness of this metaphor.

- **conspiring**: less often we see this function in sharp metaphors. Nevertheless, classification of meaning is a common phenomenon in terms of a sharp metaphor.

- **encoding**: this feature occurs more rarely than the above. But despite this sometimes sharp metaphor can serve as a prerequisite for the security classification of the characters [9 P. 35].

- **mnemonic**: review of the functions the reader watches in the works of Oscar Wilde are rare, due to the fact that it is typical for most scientific style than for art.

The following types of metaphors to be considered is erased metaphor, and metaphor-formula. These types of metaphors are very similar to each other so as that, and the other type is a common main feature even more commonplace [10 P. 151]. Nevertheless, there is a difference; it is even more stereotyped formulas-metaphors and sometimes impossibility of its conversion into non-figurative design. Let us consider in more detail these types of metaphors and their functions in the comedy material:

- Mrs. Marchmont: Pray, Mr. Montford, do not make these painful scenes of jealousy in public! In this case, we see a metaphor for “painful scenes”; the considered the metaphor could be called obliterated as its figurative nature of today is not there. The text referred to the metaphor of the following functions:

- **informative** (as it creates a complete image of the events), **conspiring** (it hides the true

meaning of statements), **nominative** (portable form values) and **emotionally – estimated** (there are negative emotions in pronouncing).

- Algernon: All women become like their mothers. That is their tragedy. No man does. That's his. [22 P. 155] In this sentence erased metaphor “tragedy” performs such functions as play (there is a certain cynicism, irony expression), **conspiring, emotionally – estimated and nominative**.

- Lady Bracknell:..., been used for that purpose before now-but it could hardly be regarded as an assured basis (“the hand-bag”) for a recognized position in good society. Here we are faced with the metaphor “an assured basis”, characterized by even more stereotyped than the above listed erased metaphors. Hence the metaphor “an assured basis” is deleted and perform such functions as **encoding** (classification of the subject), **nominative** (figurative meaning appears in the word), **emotionally – estimated** (the existence of negative attitudes).

- Lord Darlington: Ah, what a fascinating Puritan you are, Lady Windermere! [21 P. 33] In this example, the formula- metaphor “a fascinating Puritan” carries out such functions as **conspiring, emotionally – estimated, play, nominative and mnemonic**.

- Cecily: And surely there must be much good in one who is kind to an invalid, and leaves the pleasures of London to sit by a bed of pain. [22 P. 33] The proposal metaphor of “a bed of pain” is clearly obliterated, as in it there is some generally accepted, but at the same time, there is no stereotype, and the inability to convert in non-figurative design. Obliterated metaphor of “a bed of pain” performs such functions as **nominative** (it opens in a figurative meaning of the word), **informative** (it forms a panorama, the image more clearly the ongoing pattern) and **emotionally – estimated** (the word “pain” in this metaphor emphasizes all the tension of feelings and emotions).

- Sir Robert Chiltern: Gertrude, you are to me *the white image of all good things*, and sin can never touch you! There is formula- metaphor “the white image of all good things”, performs functions such as **emotionally- estimated and conspiring**.

So, after analyzing erased metaphors and formula- metaphor on the material comedies O. Wilde came to the following conclusions:

Because of the similarity of symptoms these types of metaphors, argue that they are performing equivalent functions in the text, namely **nominative, informative, emotionally- estimated, conspiring**. In rare cases, a mnemonic and encoding.

The fourth type of metaphor is in the traditional classification is quite common in the comedies of Wilde is the unfolded metaphor. Consider the function of the metaphor in the examples:

- Description: Mabel Chiltern is *a perfect example* of the English type of prettiness, the apple- blossom type. She has all *the fragrance and freedom of a flower*. There is *ripple after ripple of sunlight in her hair*, and the little mouth, with it's parted lips, is expectant, like the mouth of a child. She has *the fascinating tyranny of youth*, and the astonishing courage of innocence. To sane people she is not reminiscent of any work of art. But she's really like *a Tanagra statuette*, and would be rather annoyed if she were told so. [30 P. 32]

This example clearly traced metaphor for carrying new metaphors. In other words, in front of us it is a real unfolded metaphor carried out throughout the whole message. This type of metaphor is manifested in functions such as text-forming (the ability to generate text metaphor), **informative** (there is panoramic with depicted by the author of the text), **nominative** and **emotionally- estimated**[ 11 P. 104], [12 P. 52].

- Lady Windermere: Yes. Nowadays people seem to look on life as *a speculation*. It is not a speculation. *It is a sacrament. It's deal is Love. It's purification is sacrifice*. [20; 150] Here, as in the previous example, in front of the reader appears typical unfolded metaphor carried out in the same paragraph. In contrast to the sharp metaphor, metaphor Unfolded gives in this, as in the previous case, the softness of the text, the hill ideas, which would provide us with the author. The metaphor of the following functions: **text-forming** (as it is carried on throughout the whole message), **nominative** (disclose any figurative meanings of words), **emotionally-estimated** (present views of the author about life, accompanied by some estimate).

Lord Illingworth: That is *it's special vice*. That is *the special vice of the age*. One should sympathise with the joy, the beauty, *the colour of life*. The less said about *life's sores* the better, Mr. Kelvil. [ 20 P. 95] There is extended metaphor which carries the features such as **text-forming, emotionally-estimated, nominative and conspiring**.

Gerald: It is to take away *the bitterness out of your life*, to take *the shadow* that lies on your name, that this marriage must take place. [21 P. 65] In this example, the metaphor is used throughout the whole sentence, which indicates that the extended metaphor appears as in the previous four examples. In this case, it performs

functions such as text-forming, informative, conspiring and nominative [14 P. 35], [15 P. 27].

After analysis of the extended metaphor from the perspective of its accomplishment the certain features in the text, it should be noted that in most cases the metaphor performs functions such as:

– **text-forming**: its main feature is to go through a whole sentence, a paragraph, a message and thereby give rise to a literary text [16 P. 532].

– **informative**: due to its deploying it creates panoramic, colorful image, pleasing to the perception of the narratee.

– **emotionally-estimated**: by means of its ability to soften the text, to give it some greatness, genteelness, beauty and emotions as a consequence and the various judgments of the characters of the work.

– **nominative**: its ability is to create figurative meaning in the word [17 P. 358].

– **conspiring**: this function is found, but not as often as the above functions [18 P. 100].

The last form which we have covered in the traditional classification is a realized metaphor. The feature of this type of metaphor is that it proposes handling a metaphorical expression without regard to its figurative nature, that is, as if it was a metaphor that had the direct meaning [19 P. 351]. It is necessary to consider this type of metaphor, in accordance with the functions that it performs.

Sir Robert Chiltern: Lord Goring is the result of Boodle's Club, Mrs. Chevely. [22 P. 75] In the sentence "the result of Boodle's Club" is a realized metaphor due to the fact that it can be perceived by the narratee as if it had a direct meaning. Mentioned above the realized metaphor performs the following functions: nominative (as it carries the figurative meaning of the word), emotionally-estimated (there are judgments and emotions of the speaker), as well as a play (the presence of the comic element).

Lady Windermere: ..., and I don't see why a man should think he is pleasing a woman enormously when he says to her *a whole heap of things* he doesn't mean. [21 P. 35] The realized metaphor "a whole heap of things" contains the following functions: conspiring, nominative, play.

Thus, as part of the study of Wilde's comedies "An Ideal Husband", "A Woman Of No Importance", "Lady Windermere's Fan", "The Importance Of Being Earnest" it turns out that the author had an increased sensitivity to English word, to such stylistic phenomenon as a metaphor, his comedies includes a profound

interpretation of the very nature of the prose, not only of society and *socium*.

This article was an attempt to draw attention to the phenomenon of metaphor through consideration of linguostylistic theories and analysis of metaphorical potential of language in Wilde's comedies while solving relevant problems: review of general linguistic concept of metaphors, the definition of significance and classification of metaphors in the stylistic theory, case detection of metaphors use and the study of their types in the comedies of Wilde "An Ideal Husband", "A Woman of No importance", "Lady Windermere's Fan", "The importance of Being Earnest", a contextual analysis of the significance of metaphors on the material of Wilde's comedies and the generalization of the results. Illustration of the use of metaphors, based on four comedies of Wilde, once again proved how much metaphorical language of the writer can be rich, and that prose is not conceivable without such a phenomenon as a metaphor. That is why, interest has not still extinguished in the detailed study of metaphors, especially in the works of such well-known writer such as Oscar Wilde.

The analysis shows that Wilde uses the following metaphors in his comedy:

– **sharp metaphor** that brings together different concepts. Model: young days, picturesque protests.

– **dead metaphor** is a common metaphor and its figurative character is no longer there. Model: clever talk, gigantic intellects.

– extended metaphor which is carried out throughout a large fragment of the statement or the total statement as a whole.

Model:

*Lord Illingworth*. Don't be afraid, Gerald. Remember that you've got on your side the most wonderful thing in the world – youth! There is nothing like youth. **The middle-aged are mortgaged to Life. The old are in Life's lumber-room. But youth is the Lord of Life. Youth has a kingdom waiting for it.** Every is born a **king**, and most people die in **exile**, like most kings. ...

– **realized metaphor** involves manipulation of metaphorical expression without regard to its figurative nature, i.e. as if the metaphor had a direct meaning. Model: essence of destruction.

– **metaphor-formula** is close to the dead metaphor, but differs from it even more stereotyped, and sometimes it cannot be converted into non-figurative structure. Model: the true ideals, artificial social barriers.

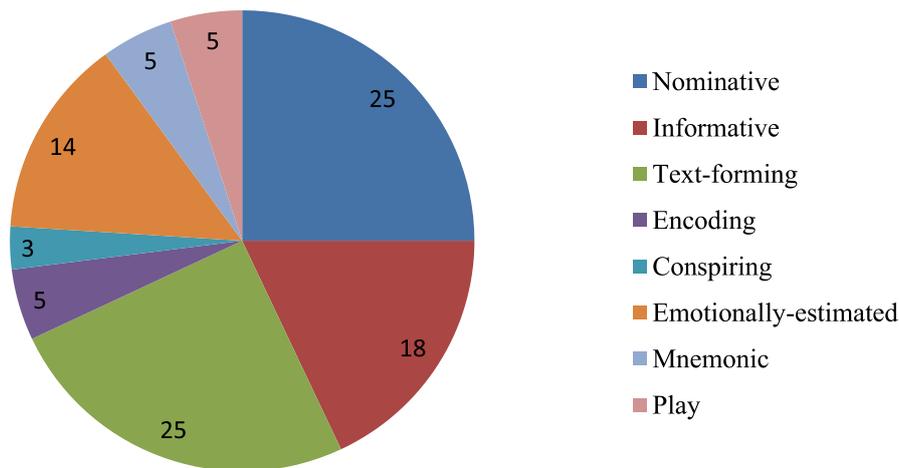


Fig. 2. Functions of metaphor

Thus, it should be noted that the metaphors, in the comedies of Oscar Wilde, make it possible to feel the psychological state of the author, as well as deep features of his character, life experience and world view. Metaphors create not only the moral and psychological atmosphere of a comedy, but they also enhance the emotional impact on the narratee.

In the description of everyday life of epoch of that time metaphors are realistic, as they help to present a faithful portrait of relations between people. Thus, the metaphors, in comedies, enable the reader to feel the connection of the inner world of the poet with a deep, mysterious and as-yet unknown laws of nature and human society.

Metaphors, in Wilde's comedies, perform many different functions (Fig. 2):

- nominative: (a metaphor in the title) it allows to develop figurative meaning in the word, creates a powerful counterweight to the formation of an infinite number of new words. In comedy, this function is primarily implemented in the dead metaphors and sharp metaphors, which are fairly common in the author's work (25%);

- informative (specificity of the metaphorical information) it is realized in metaphors ability to transmit information, creating a holistic, panoramic image. This feature is based on the nature of the visual image. O. Wilde creates colorful paintings of his experiences, emotions and feelings. He uses a vocabulary of different linguistic layers and different expressiveness – from the sublimated to explicit rude (18%);

- text-forming: it is a consequence of these features of metaphorical information

such as an image panorama. A large part of the unconscious in his structure is the pluralism of word reflections. This feature is disclosed in the extended metaphors, in their ability to be explained and continued. Certain metaphors of O. Wilde sometimes cover throughout speech (25%);

- encoding: it is to code the image (заключается в закреплении образа). Oscar Wilde uses encoding properties of metaphors to create covertness, innuendo in certain situations between lyrical heroes (5%);

- conspiring: it is to classify the meaning of the message (3%);

- emotionally-estimated: it has emotional impact on a reader (metaphor and estimation) (14%);

- mnemonic: (a metaphor and memory) it is a metaphor that contributes to a better memorization of information (5%);

- play: it creates comicality in the text (5%).

O. Wilde quite limited uses such functions as: genre-generative, heuristic, explanatory and ritual, as they are not very specific for the epoch of the late Victorian period.

To summarize, it is important to note that the metaphor provides exclusive copyright of the literary work, conveying ideas through sensory images, thereby reviving the grudging abstraction and making it closer to the narratee (reader).

Moreover, O. Wilde defines a lot of problems in his comedies, which are sensible for the writer, among them – the problem of the relationship between people; the individual with himself and the world around. The narratees directly in search of the solution of these

problems in the speech of characters. And the metaphors signifiy not the last role in it.

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## INFORMATION TECHNOLOGIES OF THE FUTURE: NANOROBOTS

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The article discusses the purpose of nanorobots, or nanites, in modern society, which introduce new paths for the development of science and all areas of society, including medicine, education, military technology, and space exploration. Particular attention is paid to the history of creation and the prospects for the study of nanites, as the revolutionary technology of the future, capable of completely changing the world and the lives of people beyond recognition. However, at the moment one of the most promising and popularized areas of research activity of scientists is the development of technology based on nanites. The main goal of their creation is the performance of important tasks in completely different spheres of human life. Previously, nanotechnology was considered by mankind as a literary fiction, beyond understanding and beyond capacity. But thanks to the scientific progress and attention of the developed countries of the world, this impossible dream, which can shake all world science, can become a reality in the near future. These microscopic machines perform the actions specified in their program that were obtained during the creation process. Nanorobots can be found in areas such as medicine, space exploration, military technology, etc. Prospects for the use of this technique are considered in our study.

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**Keywords:** nanorobots, atoms, cell level, diagnostics, nanoparticles

Nanobots are human-made automatic devices that are no larger than a molecule.

Each prototype nanomachine fulfills a specific goal. Basically, the essence of such devices is to act at the molecular level.

One way or another, at the moment, not a single case of interaction with ideally working nanorobots is known.

For a long time, man has dreamed of subjugating nature, even the smallest of its particles. This was the starting point for the development and active research of nanotechnology – a person decided to subjugate the atom[1].

It is from the size of the atom, which is no more than a tenth of a nanometer, that the term “nanotechnology” came.

The desire to subordinate particles of matter of this size led to the study of the manipulation of single particles of matter. For this purpose, numerous materials were created from the atoms of the elements in the laboratories, which earlier did not exist at all.

The history of the invention of nanorobots begins with a project to develop an electron microscope with the ability to move atoms along electromagnetic fields. Already later, in the eighties of the 20th century, a pair of rotating gears of carbon atoms the size of a nanometer was assembled. After analyzing that the project on the development of nanites can be successful, scientists begin to create the first nano-motor that operates on electric propulsion.

In 2016, American scientist Fraser Stoddart, French scientist Jean-Pierre Sauvage and Dutch scientist Bernard Fehring receive the Nobel Prize for developing a molecular device 10 thousand times smaller than a human hair, which can perform a certain range of human-programmed actions[2].

The invention of the nano-motor gave a new impetus to the development of nanotechnology. In the opinion of the Nobel Committee on the importance of the invention of a nanomotor is not inferior to the creation of an electric motor. In the future, the developers hope to process the microscopic motor into a manipulator that can rearrange atoms in places, thus facilitating work in laboratories. So, nanorobots will be able to give humanity a tool for managing nature through changing the internal molecular structure of any material.

Nanobots can be divided into several groups: with the ability to self-copying and without the ability to self-copying. Although there are some concerns about the independent reproduction of machines, scientists assure that nanites will have a strictly limited reproduction limit by an internal program.

Speaking of artificial reproduction, one cannot but turn to the study of the behavior of living cells.

In his article “The problem of behavior at the cellular level – cytoetology” of 1970, biologist V.A. Yakovlevich suggested that “cellular organelles and the cells themselves have their own little, but soul”.

Indeed, the behavior of nanorobots is similar to the behavior of living cells, which made humanity think about whether they are creating a “living system” with their free will and consciousness [3].

Now the production of nanorobots is quite expensive. To save resources, companies began working in collaboration to develop nanofactories – undeveloped nanometer-sized devices that can construct an unlimited number of complex structures from a small amount of material. The term “nanofabrika” was introduced by

Eric Drexler and in the modern world it is often used in literary fiction and cinema. According to the author of the term, the nanofactory can be programmed for replication.

In addition to nano-replications, there are such methods of producing nanobots as 3D printing on specialized printers and two-photon lithography.

Today, 3D printing is used in different areas of human life. It creates physical objects of any size using drawing and 3D modeling. The three-dimensional model of the nanobot must be accurate to microscopic details, so for the production with the help of three-dimensional printers need a highly qualified specialist and high-tech equipment[4].

Two-photon lithography uses 3D printing technology, its main difference is in higher detail. In lithography, liquid rubber is used, solidifying at the point where the laser beam was focused. The focal point of the laser moves through the rubber and leaves behind a solid line no wider than nano wide.

Today, the most useful and important area for the use of nanobots in the modern world is medicine. Because of its size, nanorobots can be used as emergency suppliers of drugs and beneficial substances to the body directly into the cells, as well as to terminate the affected organs and repair damaged tissue. Thanks to this use of nanotechnology, it is possible to deal with genetic disorders at the level of molecules and atoms.

Medical nanobots are designed to accurately diagnose and analyze diseases, collect data on the state of the human body[5].

Now in nanomedicine are considered such prospects as:

- Direct delivery of drugs to an organ or system at the cellular level.
- Artificial immunity enhancement or its weakening to combat allergic reactions.
- Surgery with microscopic incisions, which will accelerate the period of overgrowth of postoperative sutures.
- Diagnosis and treatment of cancer.
- Safe and easy distribution of vaccine components in the body.

These methods have already been tested on animals in laboratories, and at the moment scientists are ready to begin testing in humans. There is no denying that the success of treatment by nanites will forever change world medicine[6].

Due to the delivery of the components straight to the cells, or rather to their cytoplasm, the consumption of the drug itself and the chance of side effects of potent drugs will

decrease many times, since they will not affect other organs and body systems. Vaccination will also be simplified; besides, immunoglobulins can be replaced by nanorobots, which will fight off any infections that enter the body from the outside.

To date, attempts have already been recorded to use nanotechnology in medicine, and specifically to combat cancer. For this, special nanites were created – liposomes. Liposomes deliver the chemotherapeutic nature of the substance straight to the inside of the cancer cells, destroying them from the inside. For the first time this method has been used and is currently used for the treatment of ovarian cancer, HIV Kaposi's sarcoma and myeloma.

Almost any problem of terminating the "deficiencies of the human body" can be solved with the help of nanorobots. With a sufficiently developed nanotechnology, people can finally get rid of diabetes and allergic reactions, which greatly facilitate the lives of the population.

Another example of nanorobots in medicine is artificial phagocyte circulating in a person's bloodstream. The phagocyte "digests" pathogenic viruses and harmful bacteria. There is also a respirocyte capable of withstanding a pressure of 1000 atmospheres. The ability to transport oxygen with this nanobot is 256 times greater than the ability of an ordinary red blood cell.

High hopes are pinned on the femtosecond laser FEMTO-LASIK, used in vision correction.

The laser is a microscopic "scissors", carrying out the finest evaporation of nano-volumes of corneal tissue without any damage to adjacent tissues. It is also used to remove certain parts of the genome in nanosurgery of individual chromosomes [7].

The very first femtosecond laser that received a certificate from the US Department of Health in 2001 was the laser company IntraLase. In 2004, a similar certificate was obtained by installing Femtec from Perfect Vision. In 2008, Z-LASIK is certified by the manufacturer Ziemer.

Before the development of Femto-LASIK, the formation of a cornea flap occurred with the help of keratome – growths on the skin of a benign nature. After the introduction of new technology in ophthalmology, this operation was performed using a femtolaser in a completely non-contact manner. This minimized the chance of distortion or loss of vision, including the acquisition of corneal astigmatism[8].

With the beginning of the active use of nanites, medicine will expand the range of services

provided to patients, because nanotechnologies offer a chance to look inside a living cell, study healthy and damaged tissues.

But do not forget that the introduction of nanomaterials into practice requires a deep understanding of the potential risks and side effects due to the imperfection of nanotechnology. The production of new materials can cause the accumulation of waste that can cause toxic and mutagenic effects on the human body. Scientists have not left this problem without attention: this is how the branch of science appeared that was connected with the study of the safety of nanomaterials used, which was called nanotoxicology[9].

Thus, this science considers methods for the penetration of nanoparticles into the human body: oral, inhalation, parenteral and percutaneous. Such types of human contact with nanomaterials occur at the stage of production, use and processing. Nanoparticles are able to overcome huge distances in the air environment, it follows from this that they can easily enter the body through the lungs and penetrate through sedimentation on the skin. However, as the size of the particle itself increases, its probability of penetration through the alveoli of the lungs decreases. The increase in airborne microscopic particles creates more opportunities for human contact with the skin or intestinal tract[10]. An obvious example of the penetration of nanoparticles into the skin is the use of cosmetics and sunscreens. However, a study on the titanium oxide nanoparticles contained in sunscreens as an absorber of ultraviolet radiation showed that the particles do not pass beyond the horny epidermis. The study of the skin toxicity of nanoparticles and the materials used did not reveal negative side effects when various components were applied to the skin. The toxicity studies themselves are few, and nanomaterials can be classified as low-toxic and moderately toxic. Thus, nanotoxicology as an area of nano-medicine at a given time is only at the beginning of development.

### Conclusion

According to the American inventor Ray Kurzweil, by 2030 the global "cohabitation" of nanorobots and humans will take place. In the future, there will be a huge number of ways to launch millions of nanites into the human circulatory system. Nanomachines will begin to restore old cells and create new material. Thus,

scientists can talk about slowing body wear and eliminating signs of aging.

Speaking about the joint future of people and machines, it is worth mentioning such a term as cyborgization.

Cell cyborgization is a gradual replacement of a cell by nanostructures and artificial material. If the cellular material can be replaced with a synthetic analogue – nanorobots, then the process of cyborgizing neurons is much more complicated. This process will allow people to increase brain productivity and overcome its limits.

Nanotechnologies offer a lot of new opportunities and discoveries in medicine. In military science and space exploration, microscopic machines still seem fantastic, but with the development of science, science fiction can become a reality. Perhaps it is nanorobots that will make global changes to human life and all its spheres.

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## COMPUTER-BASED ARTIFICIAL INTELLIGENCE SYSTEMS

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Modern information technologies are actively being introduced into the life of our society. Begin to find the use of not only the achievements of the latest electronics and innovative technologies, but also artificial intelligence systems and computer training for students and schoolchildren. The article considers the concept of machine learning and the areas where machine learning can be effectively implemented [1]. Particular attention is paid to examples of the integration of machine learning into information systems and services. Based on the analysis of implementation, its effectiveness and practical application, the relevance of using computer machine learning is determined.

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**Keywords:** computer learning, information technology, machine learning; business, security, the medicine

Modern conditions in which information systems operate assume the use of unstructured data and effective means for working with them [2]. They collect and process huge amounts of rapidly arriving digital information and analyze it, finding certain patterns that allow the development of systems for classification and forecasting. Most often, the aggregate of such facilities is called big data [3].

Recently, the use of machine learning, which is based on big data, has become popular. This technology is widely used due to the fact that there is a wide range of areas where it can be used to solve problems. In our work, we propose to consider and tell you more about these areas and the very concept of machine learning, because today most companies are actively using or studying computer technologies, since this has become a priority for new business projects and the development of modern companies [4]. Without a doubt, it can be said, it is a promising trend of modern times.

### Machine learning concept

Machine learning is associated with the development of artificial intelligence—new scientific discipline, which emerged in the late 1950s. Even then, the idea of creating computer models and algorithms that can self-educate on the basis of incoming data and knowledge was born. This technology differs from classical static data analysis in that it uses methods and learning algorithms. In this technology we start from the hypothesis that all the subsets of homogeneous data show the same dependencies between attributes, and the distribution of attribute values does not change its character on the whole set. input data. Based on this idea, we can create an algorithm that can later be applied to new data sets without additional resource-intensive calculations. Thus, the essence of machine learning is to train the system in the course of the algorithm so that the

algorithm can correctly match the set of input parameters and knowledge and produce the corresponding result [5].

The learning process is divided into the following stages:

- Data collection;
- Giving data to a form ready for use;
- Splitting data into two groups: data to use algorithm and data to evaluate its actions;
- Training;
- Efficiency mark;
- Optimization.

Machine learning includes advanced statistical methods for solving regression and classification problems with multiple dependent and independent variables. These methods include the Support Vector Machines (SVM) method for classification and regression, the Bayes method for classification, and the k-Nearest Neighbors (k-Nearest Neighbors, KNN) method for regression and classification. Today they are at the stage of development, but it is expected that in the future their number will only grow, since solving various tasks requires different ways of machine learning.

Depending on the specifics of the task, the learning of the algorithm may be limited in time or may be an endless process. In the latter case, it is necessary to determine a certain stage in the evolution of the algorithm, allowing one to say that it is trained enough to produce the correct result. In conjunction with the methods for solving problems, we can obtain algorithms with predictive ability or algorithms to identify patterns in the data. The former are trained on a large data array of a certain system in the past, and then they try to simulate the behavior of this system on a different time interval. And the algorithms that reveal patterns help to restore or approximate the unknown function  $y = f(x)$ , which determines which result (the value of the function  $y$ ) corresponds to the input parameters (argument  $x$ ). It is important to understand that

the input parameters and the result can be arbitrarily diverse. Unlike predictive algorithms, they are not based on the chronology of the occurrence of events, but are based on qualitative parameters using the virtual event proximity function.

There are a huge number of areas where machine learning can be used. The process of informatization leads to a rapid increase in the volume of data in science, business, transport, and health care. The problems that arise in this process are often reduced to learning from precedents. A finite set of precedents (objects, situations) is given, for each of which some data is collected (measured). Precedent data is also described as its description. The totality of all available descriptions of precedents is called a training set. It is required for these private data to reveal general dependencies, patterns, interrelationships inherent not only in this particular sample, but in general all precedents, including those that have not yet been observed [6].

Based on this, it can be said that the goal of machine learning is the partial or complete automation of solving complex problems arising in various fields of human activity through the systematization, processing, analysis of gigantic information volumes.

#### **Application in business**

In companies that use the capitalist mode of production, the main means to increase profits is to reduce costs or increase sales. Machine learning can handle these tasks. First, the technology allows to reduce the time for the implementation of any internal technical processes, reducing the burden on employees or increasing the speed and volume of work without expanding staff. For example, by automating the completion and verification of input data in forms or feedback. Machine learning can also be used for predictive analytics. Many internet marketers rely on this method because it allows you to analyze every aspect of customer relationships. Due to this, it is possible to determine the most important moments in the sales process, more effectively attract customers and provide a high level of service [7].

As an example, you can call the service Google Analytics 360 Suite created for marketers. It uses data from Google Analytics, AdWords or DoubleClick Search, which allows you to collect information about your users. The service can analyze data to evaluate each ad and based on this information, you can optimize expenses, create an effective bundle of marketing channels, get to know your target audience and find new potential customers [8].

#### **Use in medicine**

Medicine and health care is the most promising area in terms of the introduction of machine learning technology. Working with data on diseases, symptoms and patients, it will be able to increase the accuracy and speed of diagnosis, and monitor the condition of patients. Machine learning algorithms can also help with predictions about how molecules behave and with what probability they will form new connections, which can accelerate the development of medicines. Machine learning can also improve organization in hospitals. For example, analyzing such data as a person's age, his address and distance to a hospital, weather conditions, one can predict the likelihood that a person does not come to the doctor's appointment and change the reception schedule.

In 2016, the British company DeepMind opened the DeepMind Health division and created a system that processes tens of thousands of medical records to highlight the necessary information. These data are used for research to create algorithms based on machine learning technologies that can detect early signs of disease [9]. DeepMind Health did not stop at this and developed the The Streams app, which contains tools that simplify the work of the doctor. This application provides real-time information about patients and sends it to doctors so that they can provide the best care for patients. It also increased the speed of patient enrollment, the results of medical examinations and the work of the hospital.

#### **Cybersecurity application**

Machine learning quickly found application for computer security. In most cases, computer-aided learning techniques are used in spam filtering, traffic analysis, and the detection of malicious software. In the security industry, there is a dispute over the benefits of antiviruses, since evil-minded people are able to bypass their protection. Therefore, large preference is given to machine learning methods that can automatically process large amounts of data with signs of threats and allow you to make decisions quickly. The main property of using this technology is that they do not replace specialists working in the field, but expand their capabilities [10]. This is due to the fact that they will learn to repel new threats, studying the already successfully repelled old attacks, inefficiently, since the defense systems already know how to repel such attacks. As soon as there is a new threat that can bypass the defense, the experts study this attack, as well as the signature for its detection. At present, the

main role of machine learning in information security is to create predictions about possible attacks with high accuracy so that experts can repel an attack in advance.

In order for a model to learn to recognize threats, it is necessary to input large amounts of data at the input. This may include Internet traffic, network flows, blogs, email messages, user activity, and more [11]. The accuracy of the forecast depends on the amount and variety of data. Further, the necessary signs are searched for in dataset. Depending on the problem being solved there may be hundreds of different signs. For example, the pre-name, the sender and his e-mail address, IP address, network session duration, protocol used, time of day, and others. On the basis of these signs, projections of attacks are compiled [12].

The main advantage of machine learning is the ability to quickly recognize patterns and anomalies in large data slices. More than this, this happens in real time, which increases the efficiency of the technology.

Information security company Distil Networks has created a machine learning technology to protect web applications from attacks based on misuse of interfaces. Distil Networks customers are provided with access to the infrastructure that analyzes the patterns of attacks in real time based on the traffic of a specific site.

This helped her take precedence in the protection of web resources [13].

**Application in the social sphere**

Machine learning opens up new opportunities that can be implemented in software and technical products. Social networks, such as Facebook, VK, Twitter and Instagram, use intelligent search robots based on AI and machine learning to rank publications and enhance user interaction [14].

Many search engines use machine learning to speed up and optimize search to make it easier for users to search for the right information. It is about simplifying complex filter systems, implementing voice and video search. Previously, at the request of the “flower shop” from the search engine was of little use, now when you enter a request, it will show us a map with the nearest shops, addresses and work times.

Thanks to machine learning, people have the opportunity to use personal assistants such as Siri, Alice, Google Assistant, Amazon Alexa, Microsoft Cortana. They use natural speech processing technology and can answer questions, execute commands, make recommendations. Some personal assistants study user information and learn their preferences in order to more effectively execute user commands [15].

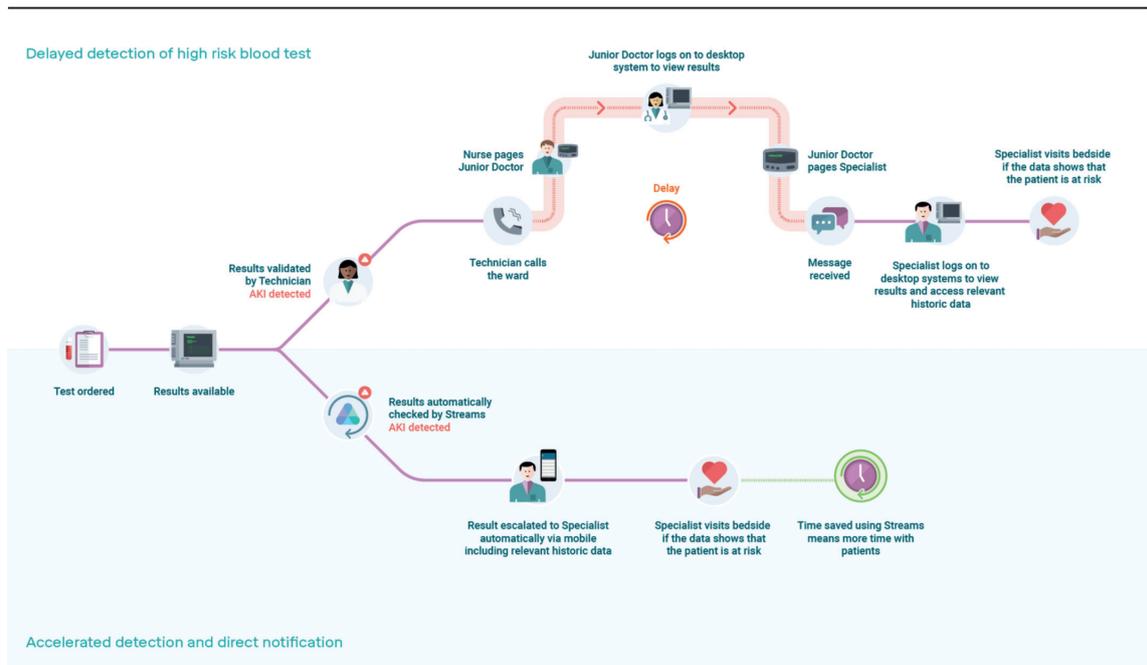


Fig. 1. An example of how Streams saves time



Fig. 2. Top web security companies

A great example of integrating machine learning into a service is Spotify. In 2017, the company acquired machine learning startups, then it added the ability to recommend music to users – the Discover Weekly playlist. Each playlist is made up taking into account the musical tastes of a particular user, and every week it is updated with 2 hours of new music. As a result, even the company itself was surprised at the results, which brought a new function, because it picked up surprisingly good recommendations, unlike its competitors.

### Conclusion

Machine learning has become a part of modern technology due to the fact that there are a huge number of areas where it is necessary to analyze all the data where no one can handle. In this regard, there are already great practical successes in this area, which we have already described. The possibilities and scope of machine learning can be scary, but it is im-

portant to know that this is just a one-of-a-kind tool for finding answers to important and complex questions. Without a doubt, this technology has enormous prospects for creating innovative tools and improving the lives of people all over the world.

Now we can only say that machine learning is only at the beginning of its path. It is not yet known what innovations it can bring and where is the border where machine learning can no longer be used effectively.

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