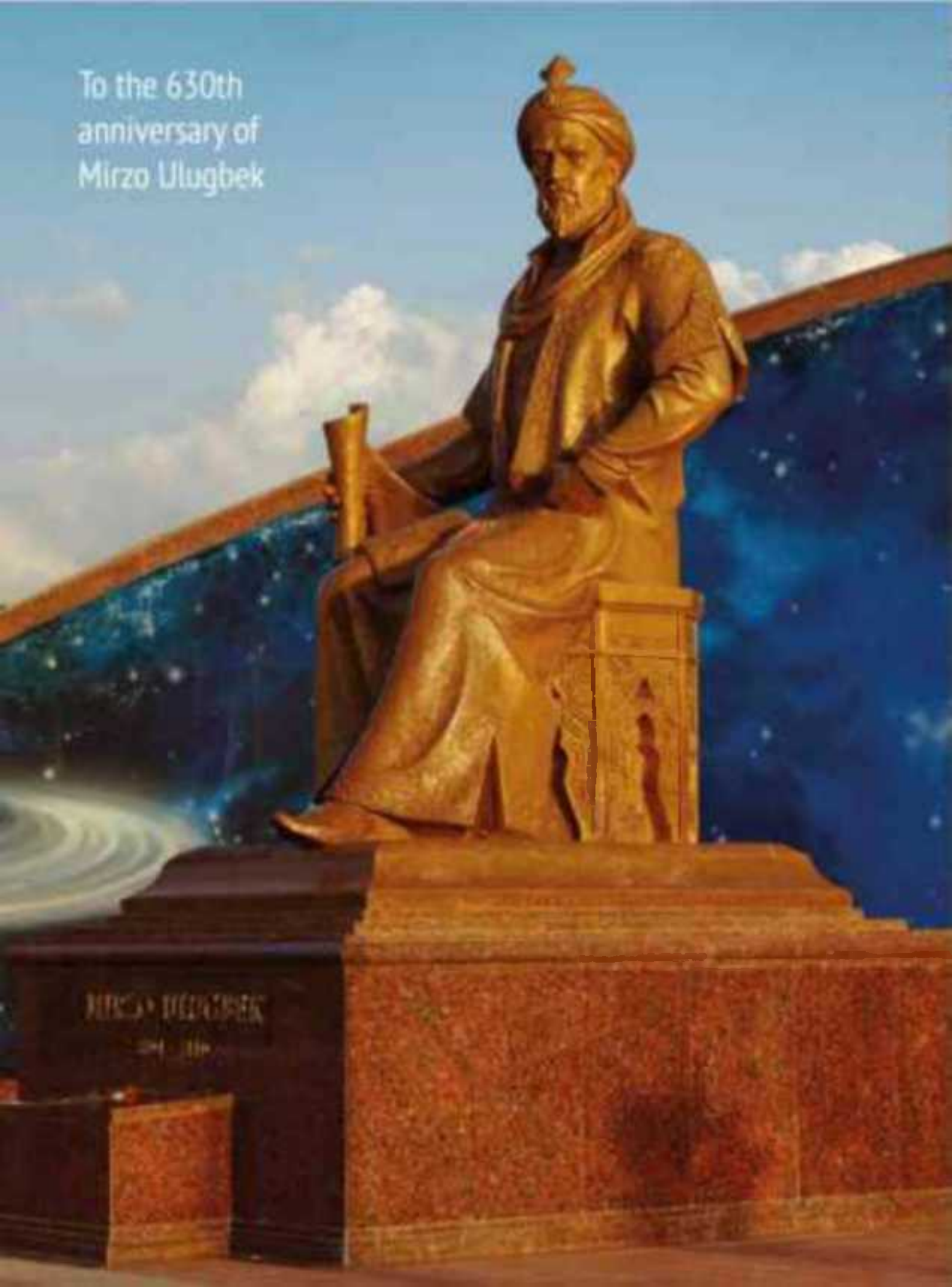
Science for the benefit of mankind

FAN VA TURMUSH

«Science and Life» popular science journal
Centre for Promotion of Science Uzbekistan Academy of Sciences
1/2024

SENSATION - UNKNOWN PORTRAIT OF MIRZO ULUGBEK

- JAZZIRAMA
- THE HERITAGE OF UZBEKISTAN IN CHINA
- BOTANICAL GARDENS – NATIONAL PROPERTY OF THE STATE
- KUNSTKAMERA IS IN FOCUS
- MEDICAL PROPERTIES OF BOZULBANG PLANT


To the 630th
anniversary of
Mirzo Ulugbek

EDITORIAL

DEAR READERS!

Favorite journal “Fan va turmush” is at your home again. A year has already passed for the new team. During 2023, 4 issues were published and reached our fans in Uzbek (in Latin alphabet), Russian and English. The first issue of the journal opened with a presentation of the thoughts of our esteemed President on science, in the 3rd issue congratulation from the President of the Republic of Uzbekistan Shavkat Mirziyoyev on the occasion of the 80th anniversary of the creation of the Uzbekistan Academy of Sciences was published.

The consistent reforms in the field of science carried out in our country are described in following articles of the President of the Academy of Sciences of the Republic of Uzbekistan, Academician Bekhzod Yuldashev, entitled “Revival of the Academy of Sciences”, published in the 1st issue of 2023, - by Deputy Editor-in-Chief, PhD Masharib Abdullaev under the title “The phenomenon of the cultural heritage of Uzbekistan - in Germany” in the 2nd issue, - by the Chief Academic Secretary of the national Academy of Sciences, Prof. Gairat Bahodirov entitled “To the 80th anniversary of the Academy of Sciences of the Republic of Uzbekistan”, published in the 3rd issue, and in the introductory article entitled “Dear Readers” on behalf of the editors, dedicated to 90th anniversary of the magazine “Fan va turmush” published in the 4th issue.

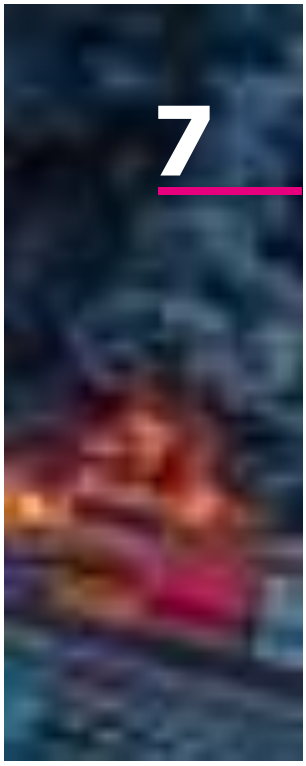
In 2023, 10 articles on mathematics, physics, and astronomy were published in the “Numbers Rule the World” section, 11 articles on biology, chemistry, medicine and other natural sciences were published in the “Nature and Man” section, and in the “World of Engineering and Information Technology” section” - 7 articles, and in the section “Society, history, culture” published - 16 popular science articles on archeology, history, language and literature, cinema, theater, fine and applied arts. Also on the occasion of the 1050th anniversary of the birth of the great scientist Abu Rayhan Beruni carried out the column “The Golden Age of Beruni” for a year. The works of young scientists on interesting and relevant topics were published in the “Tribune of Young Researchers” section. The publication of science news from Uzbekistan and world science and interesting pages will continue in 2024.

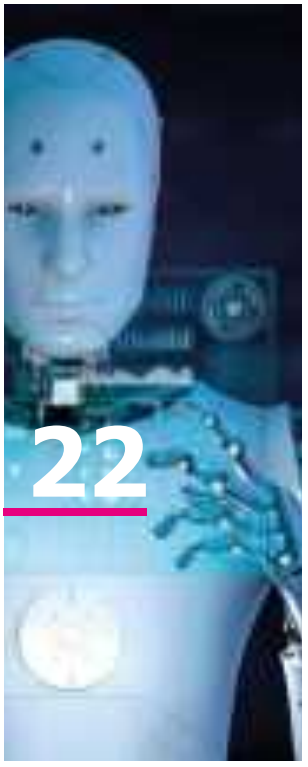
In 2023, the attention of readers was attracted by the articles of the Hero of Uzbekistan, Academician Shavkat Ayupov “The main thing in mathematics is the ability to think logically,” Academician Tamara Aripova and Ph.D. Javdat Muradkhodjaev - “Immunity - against Coivd-19”, an article “Silent Cinema of Uzbekistan” by D.Sc. (Art History) Nigora Karimova, “ Miraikan - Museum of the Future of Japan” by Zarina Nuridinova , “The Gates of Tashkent” by Prof. Abdumannop Ziyoev, “Microcosm inside us” by D.Sc. (Biological Sciences) Shakhlo Miralimova and other publications. This is also evidenced by reviews from our readers.

The 3rd issue of our journal was dedicated to the 80th anniversary of the Uzbekistan Academy of Sciences, and the 4th issue was dedicated to the 90th anniversary of the magazine “Fan va” turmush” and articles devoted to this topic were published. One of the important events - the Eureka Competition for Young Scientists and the award ceremony for its winners were held on the initiative of the Center for the Promotion of Science and were held at a high level. The winners were awarded cash prizes and valuable gifts. Also, in order to encourage young people, articles of the winners were published on the pages of the journal. The 4th issue published articles by O. Khakimov, Z. Yusupov, D. Yusupov, Z. Rakhmonov and M. Khidirova, who took first place.

In the modern era of electronic information, printed publications are giving way to electronic forms. With this in mind, in 2024 we plan to update our website, post all our issues on it, and regularly publish news in the field of popularizing science. Also on our pages on social networks we present science-related news and interesting conversations with our scientists.

CONTENTS





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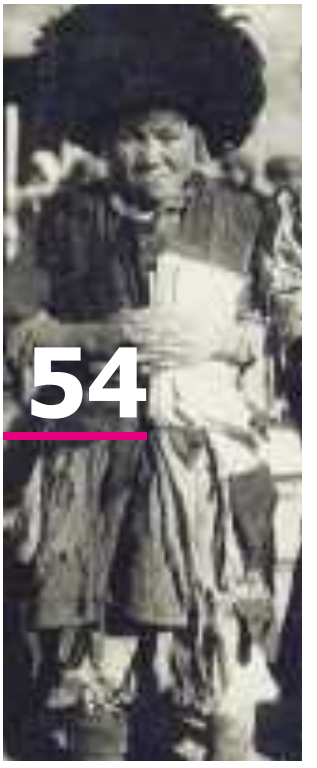

Mathematical modeling in science and practice

Mikhail Voronov,
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The development of world civilization is accompanied by an increase in the role and importance of mathematics as an important phenomenon of education and the general culture of people in general. The specific features of mathematics determine its ever-increasing importance in all areas of social life. It acts as an immutable element of development and an integrator of various knowledge, translating it into a strict logical system that can be analyzed. Mathematics allows us to display the reality around us in the language of unambiguously interpreted formulas. It is mathematics that makes it possible to create and widely use electronic computing devices, computer technologies, artificial intelligence and digitalization methods to solve various practical problems.

Today, the issues of developing logical mathematical thinking among the bulk of the population and developing the abilities of every educated person to algorithmize their activities are coming to the fore. Essentially, we are talking about ensuring a new, higher level of mathematical culture for the population as a whole and increasing the role and importance of mathematical modeling in the first place. In this regard, it seems very important to consider what mathematical modeling is in its modern understanding.

First of all, the concept of the term modeling can be defined in the most general form as follows - this is the study of any object, process or phenomenon by constructing and studying their models. A mathematical model is a formalized system of mathematical formulas (equations), with the help of which one can study a class of certain objects, processes or phenomena. A mathematical model is a kind of simplified description of the real situation associated with them, when its unimportant features are not taken into account, and the original problem is reduced to some idealized problem that can be analyzed mathematically.

It is now obvious that mathematical modeling is becoming the most important method of cognition, covering almost all areas of human activity. Moreover, it develops creative thinking in people and creates new opportunities for them. In this regard, it is important to understand the essence and capabilities of mathematical modeling and outline the most general approach to the issues of constructing a mathematical model.

Mathematical modeling is used in cases where the necessary decision must be made on the basis of available extensive information, which can be quite easily formalized. The widespread use of mathematical models makes it possible to obtain a quantitative or graphical characteristic of the problem being studied (object, process or phenomenon) and to find the optimal solution for it.

The construction of a mathematical model is largely an intellectual activity (art) of specialists, the success of which is based, among other things, on their high educational level and mathematical training in the first place. To solve a problem presented in text form and create its mathematical model, the compiler, as a rule, must use the following sequence of actions:

1. Clarification of the problem and clarification of some components of its formulation;
2. Introduction of designation by letters, numbers, signs and symbols of everything that needs to be found in the task;
3.Maintaining designations of other objects, according to the statement of the problem;
4. Formal recording of facts, information presented in text form, as well as the necessary conditions and rules for constructing a model;
5. Construction of a mathematical model, checking its correctness and assessing the level of compliance with the task.

At the first stage, the compiler must himself make,

Mathematical model based on the brain. (flectone.ru)

Mathematical information bases (rtek24.ru)

record and then take into account the decisions he makes when building the model. The second stage of his actions is associated with the introduction of a designation for what needs to be found, for example, in the literal expression of a certain unknown *X*.

Further, it is always necessary to determine what kind of mathematical object this unknown *X* is. For example, in the problem of throwing an object, this will be the distance that the object will fly horizontally, and obviously this will be a number. In another example, if the problem of determining any assortment of products is being solved, then it is required to know "what kind of product it is and how much of it is produced." In this case, the unknown must be denoted as a certain vector $X = (x_1, x_2, ..., x_n)$. If it is necessary to determine, say, a transportation plan, that is, to determine "what, how much, from where and where it is transported to," then the unknown will be the matrix $X = || x_{ij} ||$. Then the designations of all other objects discussed in the problem are introduced.

In the process of constructing a mathematical model, it is very useful to determine the type of problem statement. In this case, the following two types of problems are distinguished: - finding one of the possible solutions to problems (these are problems of direct calculation), - or finding the best option for solving them (these are optimization problems).

In problems of the first type, there are only restrictions, which are usually expressed as follows: "to be no less (or no more) than something" or "to be equal to something." The first problems are formalized by inequalities, and the second by equalities. This type includes tasks in which it is necessary to perform calculations using certain formulas (including solving systems of equations or inequalities, calculating integrals, etc.). Such tasks include, for example, problems of finding a balance between something, predicting something or a number of others.

In problems of the second type, there is a requirement to maximize or minimize certain characteristics of the object of study, which act as criteria for evaluating and selecting solution options. Problems of this type are called optimization, and the corresponding models are called normative. When considering optimization-type problems, special attention is paid to the formation of a criterion function that describes what exactly needs to be maximized or, conversely, minimized.

Then a formal recording of the facts, conditions and rules that are stated in the problem statement is carried out. In other words, the relationships in which the above-mentioned objects are located are established and their formal recording is made, which requires a certain mathematical preparation. The classification of known mathematical models is carried out into three main groups according to the following criteria: – both by the nature of the displayed properties of an object or phenomenon; at the same time, there are

structural models that reflect the structure of the object and the connections between its constituent elements (topological, geometric and others), as well as functional models that reflect any processes occurring in the object;
– and by the form of presentation of the object;
At the same time, a distinction is made between algorithmic models, which describe in the form of an algorithm the connections between the external (input), internal and output parameters of an object , as well as analytical models, in which the connections between the parameters of the object are expressed in analytical form;
- there may also be mixed models, including the above listed features characteristic of the first two groups.
At the same time, the main thing in modeling is that the principle of constructing various mathematical models will be almost the same and contains a set of common elements denoted by numbers, letters, signs and symbols.
A mathematical model can be either an indirect or a direct description model. Models of indirect description are formal constructions of certain analytical relations. The language of such a description contains only four necessary elements: - unknown, - parameter, - mathematical operation, - introduced restrictions. The vast majority of models relate specifically to models of indirect description. Indirect models, as a rule, describe a wide range of objects, and they are applicable to the study of these objects with varying degrees of adequacy. As the object under consideration becomes more complex, the construction of a sufficiently adequate model of it becomes possible only with the help of so-called direct description models with structural similarity to the object under study. These models are called simulation models. And simulation modeling is developing due to the practical need to study complex systems and due to the advent of powerful computers with a developed interface, which, among other things, allows for a new organization of input, output and display of information, as well as providing an interactive mode of operation. Almost any and even very complex object can be quite adequately described by a simulation model.

When constructing mathematical models, their developers should pay special attention to checking the conditions for using the mathematical apparatus they have chosen. Thus, in the case of conducting a sociological survey in different localities, all the statistical material obtained is always considered homogeneous, although it is obvious that residents of the south and north, cities and rural settlements or very remote areas can answer the same questions in completely different ways.
In the most general form, the structure of various mathematical models is the same, and it contains three main blocks of parameters: - input (**X**), - internal (**G**) and - output (**Y**), and the mathematical model of the object/process under study can be represented by a relationship described by a mathematical formula **Y = F (X , G)** , which allows one to find the desired value of **Y.**
In conclusion, we can say that mathematical modeling is necessary to solve the following scientific and practically important problems:
- understand and determine what an object is, what its structure, properties, laws of development and interaction with the external environment are;
- learn to control a real object/process based on the constructed mathematical model and determine the optimal methods for this control;
- predict possible direct and indirect consequences of implementing specified methods and forms of influence on an object or process.
Thus, mathematical modeling makes it possible to solve a wide range of various current scientific, educational, technical, industrial, environmental, urban planning, logistics, social and other problems that arise for specialists, which in various sectors of the economy and social development cannot be achieved by other methods.

Mathematical calculations (triptonkosti.ru)

Ensuring earthquake safety and earthquake lessons

Prof. **Mashrap Akhmedov,**
Dr. **Nematilla Nishonov** (PhD), head of the laboratory of the M.T. Urazbaev Institute of Mechanics and Seismic Stability of Structures Uzbekistan the Academy of Sciences

An assessment of the consequences of strong earthquakes that occurred in major cities around the world in recent years shows that the number of casualties among the population and the extent of material damage can be significantly reduced if the seismic risk of populated areas is assessed in advance, a seismic risk management plan is prepared and implemented, in particular, it is planned to strengthen existing and develop new structures and technologies for the construction of earthquake-resistant buildings and structures.

Currently, potential estimates of losses from future earthquakes have been calculated for various large cities and appropriate measures are being developed to assess and reduce seismic risk in the USA, Japan, China, the Philippines, etc. For example, scientists' estimates have shown that the repetition of earthquakes like 1923 in Tokyo, according to the calculations of the Japan National Agency will lead to a total economic loss of $1800 billions, its destructive effect will lead to an international financial crisis, and up to 3 million people may die. Therefore, for territories that have such an additional risk factor as a high level of seismic activity, the issue of preventing the tragic and devastating consequences of strong earthquakes is vital.

As is known, 78% of the territory of Uzbekistan is located in seismically active areas; earthquakes of magnitude 6 and higher on the MSK-64 scale are regularly observed. Therefore, in Uzbekistan it is very important to prevent seismic hazards, constantly improve the seismic protection system for the population and regions, and implement targeted preventive programs in this area. In recent years, Uzbekistan has paid much attention to issues of ensuring seismic safety, including legislative and regulatory documents have been developed and adopted, and large-scale comprehensive measures are being implemented to further improve the seismic safety system of the Republic of Uzbekistan. Wide notification of citizens has been provided about measures taken to improve the seismic safety of the population, civil, administrative, industrial and construction sites in Uzbekistan. Reforms in the field of seismic safety are being carried out with the participation of seismological scientists from the Academy of Sciences, and earthquake-resistant construction specialists from the Uzbekistan Ministry of Emergency Situations and the Ministry of Construction.

Just recently, a number of press conferences and round tables on seismic safety issues were held for representatives of the public and the media, the results of which were published in the country's press. In June 2022, the Institute of Mechanics and Seismic Stability of Structures of the Uzbekistan Academy of Sciences held an International Conference dedicated to current issues of seismic resistance of buildings

Fig.2. Fire in containers that overturned after an earthquake in the port of Iskenderun, Hatay province

Fig. 1. Regions in southeastern Turkey and northern Syria that were heavily affected by a series of devastating earthquakes on February 6, 2023

Fig. 3. Tectonic map of Turkey

and structures, maintaining and improving the reliability of urban infrastructure. Representatives of the "UzbekCosmos" Agency, institutes of the Uzbekistan Academy of Sciences and interested ministries and departments of the country jointly identified tasks that can be performed in terms of probing deformations, displacement, subsidence of land plots for the location of buildings and structures in seismically active zones, as well as monitoring reservoir dams.

Carrying out such comprehensive work by interested ministries, departments and organizations of Uzbekistan, as international experience convincingly shows, is an urgent state task, the underestimation of which can lead to very detrimental consequences for the country as a whole.

A clear confirmation of this is the consequences of the earthquake that occurred on February 6, 2023 year in southeast Turkey (Fig. 1) with magnitude M=7.8 followed by a series of powerful tremors with magnitude M=7.8, M=6.6 and M=6.5. The first two shocks with a magnitude of M=7.8 were the strongest in the country since 1939.

The tremors of the first day of the earthquake were also felt in many countries, especially in Syria, as well as in Lebanon, Iraq, on the border of Armenia and Georgia, Cyprus, Israel, Greece, Jordan and others, as well as in Ukraine in the areas of the Khmelnytsky and South Ukrainian nuclear power plants and even in Greenland. After the first earthquake, about 10 thousand aftershocks were recorded, with the strongest magnitude up to 6.7. According to the Euro-Mediterranean Seismological Center, 241 earthquakes with a magnitude greater than 4 were recorded around the world within two days of this earthquake. As a result of the earthquake in Turkey, 45.1 thousand people were killed and more than 108 thousand were injured. More than 8 thousand people were rescued from the rubble during search and rescue operations. The United Nations estimates that about 1.5 million people are homeless. In total, at least 13.5 million people were affected by this devastating earthquake.

Hundreds of residential public buildings were severely damaged, including: large offices, hotels, shops, mosques and hospitals, the Turkish fortress of Gaziantep, built during the Roman Empire and a citadel from the UNESCO World Heritage List in Syrian Aleppo. From the explosion of gas pipelines as a result of the collapse of the berth of the port of Iskenderun Containers overturned and fires broke out (Fig. 2) .

At the airport in Hatay province, the runway was completely destroyed, and huge cracks appeared in many streets, making transport communication impossible. The earthquake in Turkey led to widespread disruption of communication systems, including the failure of electricity and the Internet.

According to WHO, a total of about 23 million people were in the disaster zone in Turkey and Syria, including 1.4 million children. A state of emergency and seven days of mourning were declared in Turkey. The earthquake of February 6, 2023 is recognized as the most powerful in Turkey since the 1939 earthquake in Erzincan. As you know, the territory of Turkey is located in one of the most active earthquake zones in the world. The area where the earthquake occurred is located at the intersection of three tectonic plates: Anatolian, Arabian and African. The movement of plates creates pressure on the fault zones between them. The sudden release of the stored energy of this pressure causes earthquakes. The East Anatolian Rift is an active fault in the earth's crust

that runs beneath Turkey. It extends to the northeast, where it intersects the North Anatolian Fault almost at right angles. The area where these two faults intersect is the most seismically dangerous. Earthquakes with a magnitude of at least M=7 have been repeatedly recorded here (Fig. 3).

Since 1970, three earthquakes with a magnitude of M6 or more have occurred within the radius of 250 km of the earthquake of February 6, 2023. The largest of them, with a magnitude of 6.7 occurred on January 24, 2020. All this suggests that in Turkey the real threat of a possible recurrence of strong earthquakes has not been assessed, especially in terms of preparing the population for earthquakes and especially in matters of ensuring earthquake-resistant construction. Thus, in Turkey, one important social issue has not been resolved - ensuring the strength and seismic resistance of housing and public buildings. And this earthquake became proof that the number of victims depends not only on the strength of the shock, but also on the strength and seismic safety of housing. People in the zone of the earthquake did not live in houses that could protect them from the effects of earthquakes, but lived, as it turned out, in extremely earthquake-prone houses - simply in the so-called concrete slums, which simply folded and crumbled into dust. The designs of many houses were developed without engineering-geological surveys of soil properties, without data on the hydrogeological conditions of the construction site, taking into account the filtration capacity of soils and aggressive water, as well as without assessing the quality of concrete, mortar, etc.

New standards for safe house construction in Turkey were introduced after the devastating 1999 Izmit earthquake, which killed 17,000 people. However, as the analysis showed, in the civil engineering process in Turkey these standards and building codes between houses were not observed (very small distances), thin reinforcement and low-quality concrete were used. This is why the magnitude 7.8 earthquake caused such widespread destruction in Turkey. Despite the power of the earthquake, buildings built according to all the rules should have resisted. For example, Japan, which has a high risk of earthquakes, has very strict building codes. And in Turkey, so-called construction amnesties are periodically issued without certificates of safety standards and without fines for violations. After the deadly earthquake in the western province of Izmir in 2020, it was revealed that 672 thousand buildings in Izmir received such construction amnesty.

In Fig. 4 shows that of the Turkish cities destroyed by the earthquake of February 6, 2023, only those buildings that contained “anti-seismic skeletons” survived, while the collapsed houses that did not have “anti-seismic skeletons” fell like houses of cards, burying hundreds and thousands of people. Some newly built concrete high-rise buildings began to simply “fold” because they were built with violations of construction technology - concrete pillars, floors and gaps are laid with hollow bricks with thin walls (Fig. 4).

It is noted that the settlements close to the epicenter of the earthquake remained virtually undamaged due to the builders’ full compliance with the new standards adopted in 1999 after the catastrophic earthquake in Turkey. Thus, in Erzin (a town with a population of 43 thousand people), no one died and not a single building collapsed, since during their construction they strictly adhered to the requirements of the new standards.

The lessons learned from the earthquakes in Turkey on February 6, 2023 once again confirm that society must be aware, the construction of buildings and all facilities must be earthquake-resistant, and this must form the basis of public policy,

Summarizing the above, it should be especially noted that in countries located in seismically hazardous areas, including Uzbekistan, it is necessary to take preventive measures to minimize casualties and damage from natural disasters. For example, in a highly seismic area of Tokyo, buildings of up to 60 floors are being built that can withstand strong earthquakes; they sway but do not collapse.

The implementation of these measures is relevant for Uzbekistan, where strong earthquakes have occurred in the past and continue to occur. In this regard, the development of in-depth scientific research on the problem of ensuring seismic safety is extremely relevant, vital and requires decision-making at the state level, which is being implemented in Uzbekistan.

Increasing public awareness and preparedness to face natural disasters is a key to ensuring seismic protection for civil society and the state.

Fig.4. Destroyed building in Kahramanmaras

New generation stimulants: from test tube to practice

Abror Ruzmetov,
researcher

In recent years, the need to ensure food security and prepare for ongoing climate change has become increasingly urgent, and efforts have been made to implement agricultural transformations and "climate-smart" practices. This issue has been accepted by all UN member states as a core part of the 2030 Sustainable Development Agenda.

In the Republic of Uzbekistan, a number of results have been achieved in the development of agriculture and implementation of new types of highly effective, cheap, import-substituting, plant growth-stimulating products based on local raw materials. The Action Strategy for the further development of the Republic of Uzbekistan identifies priority tasks aimed at "increasing the incomes of farmers by at least 2 times through intensive development of agriculture on a scientific basis, bringing the annual growth of agriculture to a level of at least 5%." Accordingly, the synthesis of new types of inexpensive drugs that shorten the growing season of crops and increase productivity is important.

When using drugs, the effectiveness of plant treatment is negatively affected by two types of problems. These are abiotic (soil salinity, humidity, temperature) and biotic (fungi, bacteria, etc.) effects.

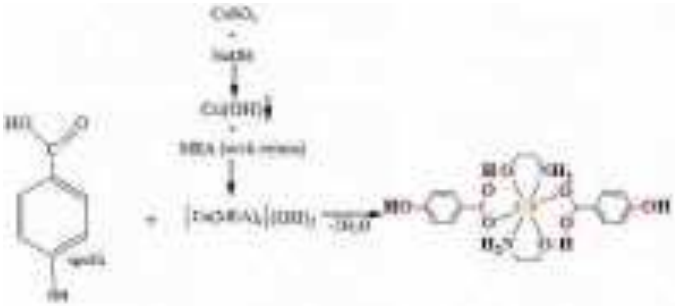
50% of the cultivated areas of our country are salinized to one degree or another. At the same time, the lack of water resources when washing off salts in the winter season negatively affects the quality of this event.

To solve these problems, one can use supramolecular complexes based on benzoic acid derivatives, which have a simple structure, are cheap and are easily available.

Why exactly?

p- hydrobenzoic acid	Monoethanolamine	Cu++
		
•Antimicrobial [10] •Preventing cell destruction [11] •Antimutagen [12] •Antialgal [12] •Esterogen [13] •Antinematoid [14] •Antivirus [15] •Antiarterogenic [16] •Antiteratogen [17] (physical disorders) •Anti-inflammatory [18] •Hypoglycemic [19] •Preventing platelet aggregation [20]	•Surfactant [21] •Solvent [22] •Antihistamine [23] •Source of N and C for bacteria [24] •In hair colors [25]	•Important for breathing [26] •Disinfectant •Conductor of nerve impulses [27] •In tissue maturation [28] •Against oxidative stress [29] •Against iron metabolism [30] •Enzyme cofactor [31]

Table 1. Reagents and their promising derivatives



Picture 1. Method for the synthesis of the complex [Cu (p - GBK)2 (MEA)2]

When choosing reagents for the synthesis of a new complex, special attention was paid to the fact that they were cheap, easily accessible, and had promising properties (Fig. 1). The results of the study of selected reagents are presented in Table 1.

The complex P-1 molecule is located at the center of the inversion of the triclinic system. In it, the Cu(II) ion is coordinated with two p - GBK molecules and two MEA molecules, and the molecular formula of the substance looks like [Cu(p-HBA)2(MEA)2] (see Fig. 2).

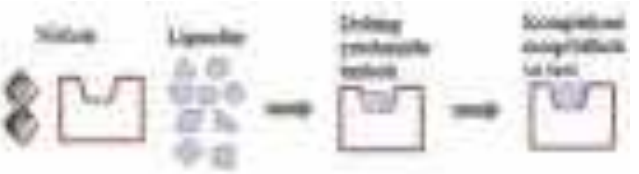
In the p-GBK complex is bound to the metal in the monodentate state through the O1 oxygen of the carboxyl group, and the MEA molecules are coordinated

Figure 2. Structure of the ORTEP metal complex.

in the form of a chelate through the N1 and O4 atoms.

The atoms in the asymmetric part of the molecule are numbered and the ellipsoids are drawn with a 50% probability level.

Antimicrobial activity. Previous laboratory studies to determine the properties of new complex compounds made it possible to determine the effective concentration of the active substance, which had a positive effect on the germination of cotton seeds, as well as on the growth, development and yield of cotton during vegetation studies. Effective concentrations of 0.02% and 0.002% of the Cu+p-HBA+MEA preparation were also used in bacteriological studies to determine antimicrobial activity against microorganisms living in cotton seeds. The experiment was also carried out at higher concentrations to determine the optimal concentration at which the drugs are most effective. Thus, for Cu + p - GBK + MEA, concentrations of 2.0% and 4.0% of the active substance were chosen. For comparative control, cotton seeds were soaked in distilled water and the drainage of this water was used for microbiological studies. The reason for choosing a high concentration of the studied drugs is based on the fact that the synthesized compounds have an antiseptic effect and more effectively reduce bacterial contamination of cotton seeds.



Before microbiological studies, cotton seeds were soaked in water (control) and test preparations in specified concentrations. The tests were carried out on cotton seeds of the elite variety “Sultan”. Seeds soaked in solutions were left at room temperature (24°C) for 24 hours.

To determine the antimicrobial activity of the test drug after soaking cotton seeds with a solution of the selected complex compound, it was planted three times in a universal cumulative medium - meat-peptone agar medium ((GPA)). After completion of bacteriological sowing, Petri dishes with seeds were placed in a thermostat and kept at the optimal temperature (26-27 o C) for the growth of microorganism cells.

When cotton seeds were pre-soaked in the studied preparations, colonies of microorganisms were found in much smaller quantities in a Petri dish, which is especially effective when using a solution of [Cu(p-GBK)2(MEA)2] at a concentration of 4.0% (see Figure 3).

Further studies to determine the antimicrobial activity of the studied substances showed that a decrease in the concentration of the active substance of the tested drugs led to a decrease in their ability to suppress the growth of microorganisms. Thus, for Cu(p-GBK)2(MEA)2] at concentrations of 0.04% and 0.004%, the number of microorganisms is more than 51 million KHB/ml. Although these concentrations showed less antimicrobial activity compared to [Cu(p-GBK)2(MEA)2] at a concentration of 2.0%, they were still more than 2 times more effective than the control.

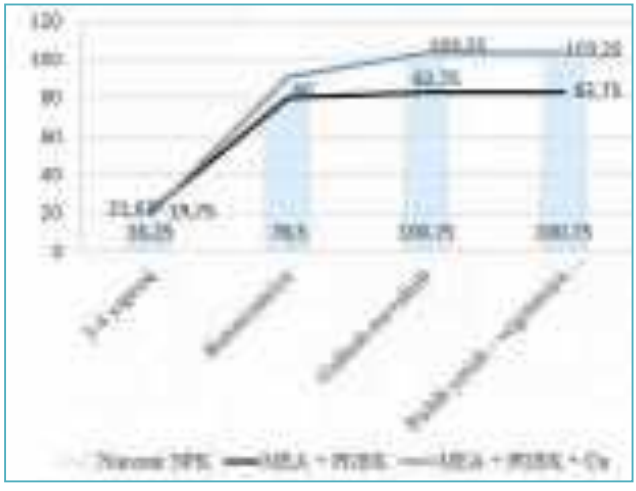
Figure 3. Effect on microbial growth of [Cu(p-GBK)2(MEA)2] at 4% (bottom row) compared to control (top row).

Figure 4. Effect of Cu+p-GBK+MEA at 0.004% concentration (right), compared to seed deterioration in the control vessel (left).

Cotton seeds were placed in glasses, where they were treated with solutions of the test substance to determine the time of seed rotting. On the seventh day, germination of cotton seeds was observed in the vessels; solutions of [Cu(p-GBK)2(MEA)2] with a concentration of 0.004% were especially effective in this (see Figure 4). During this period, the seeds left in water for control died in the process of spoilage.

An activity that accelerates plant growth and increases yield. Of particular importance is the study and synthesis of new physiologically active substances - substances that regulate the growth and development of plants. All growth regulators, as a rule, are highly specific active compounds, therefore the development and use of synthetic plant growth and development regulators are primarily related to the needs of agriculture.

Hydroxybenzoic acids (for example, o-hydroxybenzoic acid and its derivatives, acetosalicylic acid or 5-chlorosalicylic acid) have antibacterial and antifungal properties. It is known that plants that do not accumulate salicylates at all are susceptible to viral diseases. The growth stimulating effect of MEA is quite large, so preparations based on this substance are used as growth stimulants. Taking into account these properties of the ligands, we tested what capabilities they provide to metal complexes in the range of action. In this regard, in 2020-2022, comprehensive laboratory and field studies were carried out to study



3-4 leaves Budding Flowering-fruiting Ripening - vegetation

Figure 5. Effect of compounds on phenological parameters of cotton

supramolecular compounds in order to determine properties that stimulate plant growth and development.

During the experiments, the compounds we selected for agrochemical research were designated as follows: No. 1 - mixture p - GBK and MEA, No. 2 - [Cu(p-GBK)2(MEA)2] .

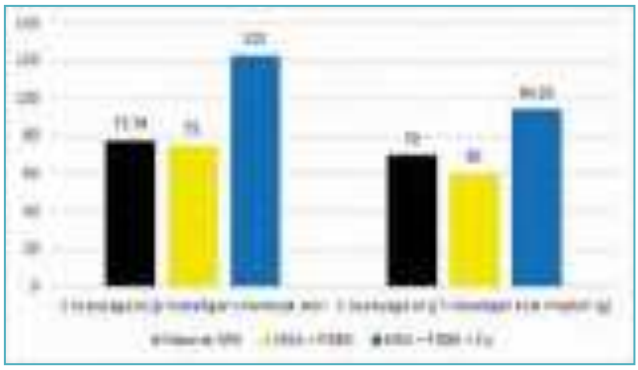


Figure 6. Data on yields obtained as a result of the use of new stimulants

Since all drugs were selected as plant growth regulators, it is logical to use them to assess physiological activity. The studies were carried out on seedlings of cotton varieties AN-Boyovut-2, which is a representative of dicotyledonous plants. First of all, studies were carried out to select the required concentration of the drug, which was aimed at achieving the maximum percentage of influence on the germination of cotton seeds. The range of concentration changes was from 0.02 to 0.0004%.

Cotton seeds were immersed in a stimulant solution for 24 hours. The swollen seeds were placed in Petri dishes on filter paper heavily moistened with the test solution and placed in a thermostat at 25°C. The germination of sprouted seeds was monitored every day, and after 5 days the weight of the sprouts was determined.

In total, 2 variants of the synthesized compounds were studied, while seeds treated with water were used as a control for comparison. Tests were carried out under the influence of drugs in three concentrations (0.02, 0.002 and 0.0002%). Based on the conducted research, the results of general phenological indicators 6F were obtained cotton under the influence of the tested drugs (see Fig. 5), and the final indicators of cotton productivity as a result of the use of new stimulants were determined.

As can be seen from Figure 8, the stages of development after planting the seed in the ground are divided into 4 periods. This is the growth of the seedling until the appearance of 3-4 leaves, budding 7F, the period of flowering-fruiting of formed buds and the last stages of the growing season. All types of drugs used were effective according to the control plant. Of these, No. 2 ([Cu(p-GBK)2(MEA)2]) increased by 3.25%. It was noted that by the flowering-fruiting period, the effectiveness of drug No. 1 (p-HBA and MEA) in comparison with the control plant stopped developing.

Based on the phenological properties of the tested preparations, it was noted that the composition is a complex compound consisting of MEA + p - GBK + Cu.

Sample	Control	[Cu(p-GBK)2(MEA)2]
3-5 leaves 28.05.21	16.25	19.75
main trunk i	78	91.25
30.06.21 Number of sympodia on one plant	13.0	16.75
Fruiting 28.07.21 Number of sympodia	13.55	17.75
MaturationMass i	70.4	94.35
Yield (%)	100	134.8

Table 2. Results observed in crops during the season

Below, Figure 9 shows the yield changes with the new stimulants.

As can be seen from this chart, all treatments increased the number of cotton bolls produced compared to the control plant. At the same time, the greatest result was shown by drug No. 2 - 121 boxes, followed by drug No. 1 - 104 boxes.

Despite the smaller number of bolls, preparation No. 1, compared to the control plant, showed an excess of the total mass of cotton fiber by 34.8% and showed a high result. In general, cotton yield refers to the amount of fiber, which is the main raw material. Considering this, according to the results of agrochemical studies, the compound with combination No. 2 was noted as the most suitable choice.

The following year, repeated tests of drug No. 2 were carried out. In practice, an increase in yield of 34.8% was recorded compared to the control (see Table 2).

The yield of cotton raw material is the main criterion that determines the effectiveness of the drug. The results of field experiments confirm that the yield of raw cotton in the experimental group exceeded the yield obtained in the control plant variant (NPK) by almost 35% (see Table 2 and Figure 7, (a).

Figure 7. Effect of [Cu(p - GBK)2(MEA)2] on cotton yield: (a) control and (b) yield and appearance of cotton bolls treated with [Cu (p - GBK)2(MEA)2]

It should also be noted the stimulating effect of [Cu(p - GBK)2(MEA)2] on the early opening of cotton plants (3-5 days). It was noted that the weight of cotton buds in the control variant (NPK) and the experimental group was almost the same - 3.5 and 3.7g more, respectively (see Fig. 7, (b)).

When comparing the proposed drug with existing related stimulants, [Cu(2,4-D)2(Py)2H2O] (20%), [Cu2(2,4-D)4(DMSO)2]·DMSO (7.4%) [152; p.104], monoethanolamine, showed an increase in yield up to 14% [153; 4-6 pp.]. If you look at the latest research, the connection we propose is superior to existing ones in some respects.

Botanical gardens – national property of the state

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Botanical gardens are places of relaxation where you can calmly enjoy the beauty of the vegetation given to humanity by nature, away from the bustle of the city, the noise and the concrete surroundings of buildings. The best botanical gardens in different countries of the world are treasures of natural beauty and a national treasure of world significance; they are protected by the state, environmental organizations and are among the UNESCO cultural heritage sites. Botanical gardens in countries around the world occupy different areas, have different fields of scientific activity and a variety of collections of vegetation and their species content - woody, subtropical, cactus, floral, medicinal and others. Botanical gardens around the world are currently under the jurisdiction of municipal, city and regional authorities, agricultural, educational and environmental departments and organizations, academies of sciences and large universities, as well as private individuals and companies.

As a rule, botanical gardens are multidisciplinary scientific institutions and carry out significant research work in various areas of botany, floristry of trees (deciduous, coniferous plants, lianas, etc.) and shrubs, ornamental and medicinal plant growing, fruit growing and viticulture, floriculture and seed growing. For this purpose nurseries and reserves are created in botanical gardens to study the introduction and acclimatization of various plants, arboretums and arboretums with the most striking representatives of the vegetation of various continents, geographical and climatic zones, as well as herbariums and bioresource collections. Study issues are also important in the activities of botanical gardens, reproduction, conservation and propagation of rare and endangered plant species, breeding new varieties of cultivated plants, as well as cooperation and exchange of seed funds with other related botanical gardens.

In post-Soviet countries, significant attention is paid to the development, as well as state and departmental support of botanical gardens. In Russia, a special place among them is occupied by Sochi Arboretum and the Southern Cultures Park, the botanical gardens of Moscow and St. Petersburg State Universities, the Polar Alpine Botanical Garden (Kirovsk, Murmansk Region), the Siberian Botanical Garden (Tomsk), Gorny botanical garden of Dagestan scientific center, Russian Academy of Sciences (Makhachkala) and a number of others. In Belarus this is the Central Botanical Garden of the National Academy of Sciences of Belarus, in Georgia - the Tbilisi Botanical Garden and the Batumi Botanical Garden - “Cape Verde”, in Uzbekistan - the Tashkent and Ellikkala Botanical Gardens of the Uzbekistan Academy of Sciences and botanical gardens in other countries of Central Asia.

Historically, the first botanical garden in Tashkent with an area of 8 hectares was created in 1922 on the territory of the garden of the former Turkestan Governor-General, located along the Ankhor canal. Initially, this garden belonged to the Turkestan (since 1923 Central Asian) State University in Tashkent. In 1944, the botanical garden was transferred to the jurisdiction of the Uzbekistan Academy of Sciences, which continues to be part of it to this day.

Professor of the Turkestan, then Central Asian University in Tashkent P.A. Baranov, a scientist in the field of anatomy, morphology and biology of plants, a researcher of wild and cultivated vegetation, who was later elected a corresponding member, took part in the formation of the Tashkent Botanical Garden in 1921 - 1923 USSR Academy of Sciences, and Professor I.A. Raikova, a scientist in the field of botany, introduction and selection of plants, elected corresponding member of the Uzbekistan Academy of Sciences.

It is noteworthy that both of these scientists studied in detail the flora not only of Uzbekistan, but also of many mountainous regions of Central Asia. Thus, I.A. Raikova and P.A. Baranov took direct part in numerous botanical mountain expeditions and in the

Tashkent Botanical Garden (advantour.com)

organization in the 1930s the highest mountainous Pamir Botanical Garden in the world named after A.V. Gursky. This Pamir Botanical Garden was founded in 1940 on the initiative of P.A. Baranov and I.A. Raikova on a terrace above the city of Khorogo, located on rough terrain at altitudes from 2320 m to 3500 m above sea level. For the important results obtained in the first Pamir expeditions of 1923, I.A. Raikova was awarded a silver medal of the Russian Geographical Society. She organized and supervised research on botanical geography and systematics, described a number of plant species new to Central Asia. 10 new plant species and one of the peaks of the Muzkol ridge in the Eastern Pamirs were named after I.A. Raikova.

At the same time, the relatively small territory of the Tashkent Botanical Garden in the initial period limited its further development and transformation into a scientific institution. In this regard, it was decided to expand the garden and move its location. And in its new guise, the Botanical Garden was founded in 1950 on the territory of 80 ha in the Yunusabad district of Tashkent. For more than 30 years, the famous scientist - botanist, Academician of the Uzbekistan Academy of Sciences F.N. Rusanov, one of the founders of the new territory in 1950, worked as the director of the Botanical Garden of the Uzbekistan Academy of Sciences in 1950. Since January 1, 1968, the garden has been a research institution under the name "Botanical Garden named after Academician F.N. Rusanov of the Uzbekistan Academy of Sciences." Since 1993, the Botanical Garden has the status of a specially protected natural area and is currently included in the national heritage of the Republic of Uzbekistan.

In 1995 Tashkent mayor's office decided to transfer 22 hectares of land from the Botanical Garden to the needs of the new Tashkent Zoo (opened in 1997);

in this regard, unfortunately for scientists and admirers of this garden, a number of tree plantings were cut down. At the same time, as compensation, greenhouses and a new hothouse as well as an area for medicinal plants was created and landscaped.

The expositions of the Botanical Garden of the country's Academy of Sciences widely represent the diverse flora of Europe and the Caucasus, the Mediterranean coast, Central and East Asia (China), as well as North America. The collection of introduced plants of the Botanical Garden includes more than 4.5 thousand species, forms and varieties of vegetation representatives - trees, shrubs, vines and others.

Nelumbo nucifera\Tashkent Botanical Garden (advantour.com)

Botanical Gardens, Kew (London, England)

Metasequoia glyptostrobeformes, Tashkent Botanical Garden

In the Botanical Garden, the main components of the resistance of tropical plants to temperature stress were identified and determined, 100-point scales for assessing the decorativeness of woody plants were developed, and the decorativeness of 1,456 species and forms of woody plants was assessed. The longevity and vitality of woody plants in Central Asia have been studied. The connection between the introduction of herbaceous monocotyledonous plants in Central Asia and the characteristics of edaphic conditions and the range of ecological conditions of natural habitats is shown. Employees of the Tashkent Botanical Garden prepared and published a 14-volume work entitled "Dendrology of Uzbekistan".

Scientific research on the introduction of plants in Uzbekistan, as well as the relocation of native plants, is associated with the Tashkent Botanical Garden. In total, over the years of the garden's existence, attempts were made to grow 15 thousand species, about a third of them took root in the garden. And over 400 species of ornamental, fruit, medicinal and forest plants were sent for economic use. Particular attention was paid to replenishing the garden's exposition with rare and endangered plant species that are difficult to grow, as well as medicinal and floral and ornamental plants. Professor and botanist Z.P. Bochantseva created flower plantations, grew many new varieties of tulips in the Botanical Garden and on this basis prepared and published a monograph of the same name dedicated to tulips in the Netherlands as well.

Among the types of vegetation with which scientists are working on introduction are ornamental and fruit trees, various berry bushes, and medicinal plants. For landscaping, seedlings of the tulip tree, Chinese poplar, Lankaran acacia, large-leaved linden, pyramidal oaks, as well as perennial bulbous plants - tulip, crocus, hyacinth and rhizomatous plants - iris, peonies, over 90 forms of hybrid hibiscus.

The Tashkent Botanical Garden of the Uzbekistan Academy of Sciences pays special attention to the development of international scientific cooperation. The Botanical Garden maintains scientific relations with 477 botanical gardens and more than 200 scientific organizations in other countries and annually provides 15 thousand seeds for exchange with other botanical gardens in many countries of the world.

In 1959, the second most important Botanical Garden was created in the Ellikkala district of the Republic of Karakalpakstan. In its scientific direction, the Ellikkala Botanical Garden of the Karakalpakstan

Desert Botanical Garden (Phoenix, Arizona, USA)

regional branch of the country's Academy of Sciences is a unique scientific object with a herbarium fund. This is the only scientific institution involved in the introduction and acclimatization of plants from various geographical zones and regions in the extreme environmental, soil and climatic conditions of the Southern Aral Sea region. Many rare and endangered species of local flora also grow and are protected here. Their ecology and biology are studied under stationary conditions, species and forms useful for the national economy are identified, as well as the scientific basis for the introduction of wild plants into cultivation is developed.

The garden's collection consists of more than 125 species of trees and shrubs, subshrubs, lianas and 80 species of herbaceous plants; it includes a number of rare and valuable plants that naturally grow on different continents.

Scientists from the Botanical Garden of the Republic of Karakalpakstan have studied the effect of soil and groundwater salinity on the condition of woody plants. The longevity of woody plants on saline soils in the south of the Aral Sea region has been established. Rare and endangered species in culture and nature have been identified and studied. The species composition of native and introduced woody plants used in landscaping cities and towns in the south of the Aral Sea region has been determined, as well as their life forms and geographical origin.

The seed fund of local and foreign plants includes 270 plant species. Of these, 76 are seeds of introduced trees and shrubs, 129 are herbaceous plants, 65 are seeds of plants of the natural flora of Karakalpakstan.

The Botanical Garden of the Karakalpakstan Branch of the Uzbekistan Academy of Sciences actively cooperates with 19 foreign and 50 botanical gardens of the CIS countries, exchanging seeds and planting material with them. The Ellikkala Botanical Garden is a scientific institution of the Republic of Karakalpakstan, which is developing an urgent problem of botany today - the introduction and acclimatization of plants in the low-water zone of the Aral Sea region, and there are all conditions for the further development of this botanical garden.

Botanical gardens are objects of national heritage, pride and are under state protection. In this case, it is necessary to highlight the most important areas of research carried out in botanical gardens on introduction and acclimatization, morphology and anatomy, protection of immunity and seed production of plants. It is also important to note the work on creating thematic and species displays of vegetation in botanical gardens, cultivated and adapted from various geographical and climatic zones, as well as organizing national herbariums and beautiful, attractive landscape architecture.

All these works are aimed at the further development of botanical gardens in different countries of the world, and botanical science in general.

Medical properties of bozulbang plant (lagochilus)

Prof. Dr. **Alimjon Matchanov,**
(D.Sc. in Chemistry)

Plants of the genus Lagochilus have long been known for their healing properties; they are among the well-known, effective hemostatic medicinal plants of the East. And today, drugs based on them are effectively used to stop various types of bleeding. Plants of the genus Lagochilus are found in Iran, Afghanistan, the Himalayan Mountains, as well as in the Caucasus and some provinces of Mongolia. In May-April, Lagochilus covers the mountain systems of the Tien Shan and Pamir-Alai. Due to its external similarity, Lagochilus is called “cleft lip” (from the Greek “lagos” - hare, “cheilos” - lip). Plants of the genus Lagochilus occupy a wide ecological niche: from plains to highlands. Many of the representatives of the genus have adapted to the hot conditions of the foothills and midlands of Central Asia. However, some of its species can be found at altitudes of up to 3200 m above sea level. The bluish tint of Lagochilus can be observed from late April to November. Although this plant has a bitter taste as in the shoot stage, and at the final stage of growth, it serves as food for small livestock. It is distinguished by the fact that it retains its bluish color even when the surrounding plants turn yellow from the sun’s rays in summer. This indicates its resistance to drought.

The knowledge accumulated over centuries by traditional medicine lies at the basis of modern scientific medicine; it was regularly used by S.P. Botkin, I.P. Pavlov and other scientists. It is known that 502 plants, representing 268 orders and 97 families, were studied as hemostatic plants. Of these, Asteraceae make up 59 (11.7%), Lamiaceae - 55 (10.3%), Rosaceae - 34 (6.7%), Arctostáphylosúva-úrsi - 29 (5.7%), Legumes - 20 (4%) etc., other plants are also used as hemostatic agents. In Central Asia, there are more than 7,000 species of plants, of which 700 have been studied from the point of view of medicinal properties. The first information about the chemical composition and intoxicating properties of the bozulbang plant is described in detail in the scientific works of a large number of scientists. In particular, according to T.I. Tsukervanik, 44 species of bozulbang plants are common in the world flora, of which 25 species are found in Central Asia and 17 species in Uzbekistan. A relatively common species of plants of the genus Lagochilus - Lagochilusinebrians - intoxicating lagochilus (intoxicating bozulbang). The main active ingredient of the Lagochilus plant is lagochilin, which is a tetrahydric alcohol belonging to the group of diterpenoids. Thanks to this substance, most plants belonging to the genus Lagochilus have hemostatic properties. The only drawback of the diterpenoidalagochiline is its poor solubility in water. As a result, the effectiveness of biological activity is relatively limited. As a result of many years of efforts by a group of scientists at the National University of Uzbekistan, based on the main active substance of the

plant - lagochilin - the drug “Lagoden” was created for intravenous administration, its water-soluble compound is the sodium salt of lagohirzin. During this process, lagohirzin was first isolated from a representative of this family - Lagochilus coliformis. However, due to the fact that the amount of lagohirzin in the vegetative organs of this plant is relatively small, and the natural supply of this plant is also limited, a method for the synthesis of lagohirzin based on lagohilin was developed. However, the synthesis of the drug Lagoden is a rather complex process, including five stages, as well as requiring expensive reagents and solvents, so its cost is relatively high. Its decoctions and tinctures have been used for various types of bleeding. But the use of decoctions and tinctures of the Lagochilus plant causes a number of inconveniences, including a lack of precision in dosage and a bitter taste.

Therefore, scientists recommend taking Lagochilus plant extract in tablet form. In addition, over the years, along with the increase in demand for preparations based on the Lagochilus plant, the natural reserves of wild Lagochilus have sharply decreased, and now it is listed in the Red Book as a rare plant. Therefore, today the collection of this unique endemic plant is limited. Currently a group of scientists from Gulistan State University, Samarkand State University in collaboration with scientists from the “Botanical Garden” of the Belarusian Academy of Sciences are working on the cultivation of this plant based on the biotechnological method. Preparations such as “Glilagin”, “Lagovin”, developed by scientists of Uzbekistan, are created on the basis of the basic active substance of this plant, and now in practical medicine “Glilanin” tablets of 0.005 g are used.

The practice of selecting Lagochilus by cultivation, a comparative study of its chemical composition, and the production of new drugs based on its main active ingredient show that this is one of the urgent tasks of modern pharmaceuticals.

Introduction of artificial intelligence programs in teaching creative specialties

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Muhammad al-Khwarizmi Tashkent University of Information Technologies accepts the complex challenges of our time in the educational system and tries to minimize any risks and intellectual losses when changing educational programs. With the widespread development of artificial intelligence in the last few years and its overall implementation, the teaching staff of the university cannot stand aside and, trying to understand, study and understand the new reality, is introducing some practices of working with Artificial Intelligence (hereinafter referred to as AI) programs in teaching. It is important to note here that the university has a department of Artificial Intelligence, but this article will focus on the use of AI programs for students who have traditionally studied creative specialties and according to generally accepted standards and programs for editing, dramaturgy, and cinematography, without the use of artificial intelligence. Graduates of the "Television and Media Technologies" department are considered specialists of a fairly wide profile (the training program is structured so that by the final course they have fully mastered the ability to write the outline of a script, and independently film a course work, and then edit and voice it). Here it is difficult to overestimate traditional education and the foundations laid by the great masters of film production and television, but it also makes no sense to neglect new technologies that definitely simplify the life of a modern person. The latest tools have rapidly burst into cinema and television. Audiovisual culture has become part of worldwide digitalization.

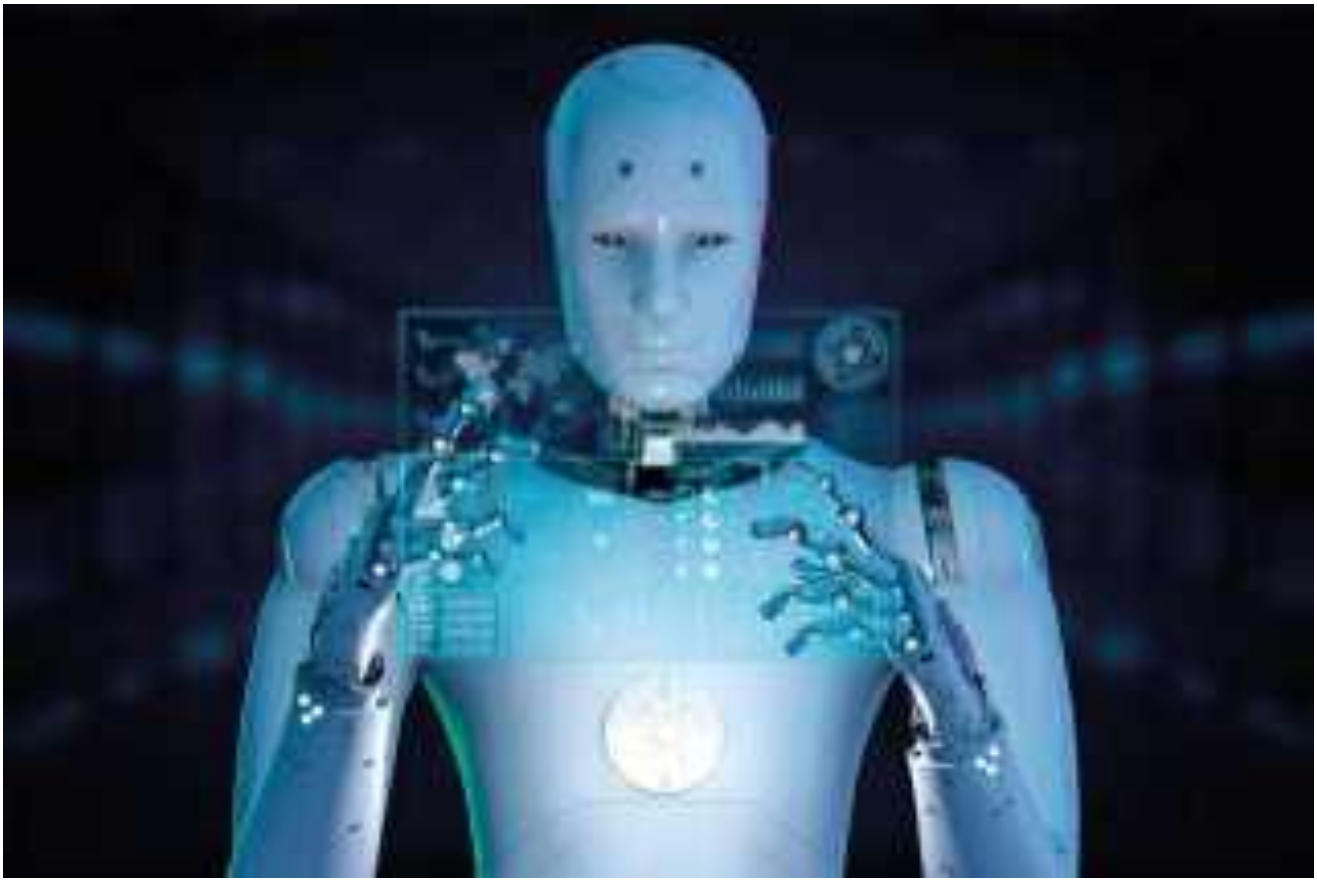
Cinema has always remained a kind of mystery, magic and fantasy world for people. There is hardly anything comparable to the feeling when you are immersed in the atmosphere of a fictional world that makes you believe in the world of space aliens or superpowered superheroes saving the planet, when you can see the elements of an alien planet, or, together with the main characters, reveal over an hour and a half complex detective story. Cinema has long been a part of our life; just think about how much time you can spend without watching a movie? Day, week, month? The answer will be a revelation, even if you have never thought about it. A person will want to watch a film in his favorite genre very soon if he is forcibly left without this entertainment. But do we think about what role artificial intelligence plays in filmmaking today? It would seem that when talking about artificial intelligence, we first of all mean something complex from the field of medicine, engineering, etc. However, he also stepped into creative specialties, including screenwriting, directing, sound engineering, editing, producing and other areas and areas of cinema. For example, now you can create, using artificial intelligence in the Dramatron program, a script, or the basis for a script, a film, a play, or a series. This program is capable of independently organizing a full-fledged version of the script, which, by and large, can remain in its original form without modifications. However, after interviewing directors, film directors, and playwrights from the test group, a general opinion was formulated that they would not use the work from Dramarton in all seriousness, without modifications and significant changes to the script. It is known that this tool was created by the Deep - mind company with the participation of 15 screenwriters who contributed their experience, knowledge, and wishes to the creation of the program. The developers tried to do everything to make the program easy to use and

save time for those who are trying themselves in the field of screenwriting. In fact, the time savings are really noticeable; the creation of the text itself will only take a moment, compared to the cost of registering in the program and gaining access to the work. First you need to register and get two API keys, they are needed in order to use Dramatron on the GitHub page. The first key is necessary in order to be able to create tasks (API OpenAI), and the second key is necessary to regulate the level of toxicity of the words used (API Perspective). Surprisingly, Dramatron is "learned" to create believable, living texts that, at first glance, are indistinguishable from texts written by playwrights. But not everything is as simple as it seems at first glance. "Intelligence" is a suitable word for a program that can add texts and output a common denominator, but the term "artificial" also has a significant meaning in this case. The program lacks a creative spark and non-standard choice of options. What is created in Dramatron is a kind of matrix, thanks to the use of which, as mentioned above, you can save time, but not create a magnificent and extraordinary script. The text is filled with formulaic plot lines, the archetypes of the characters are written rather callously. However, many playwrights have recognized the fact that thanks to the use of the program, it is possible to sufficiently check the plot moves described in one's own script, add several parallel lines and other things that often elude the screenwriter, due to multitasking and the desire to embrace the immensity in one work. It is important to note that artificial intelligence is unlikely to ever completely replace human intelligence in creating a script, so the need to introduce concepts such as "plagiarism," "copyright," and "intellectual property" into training programs for screenwriters and playwrights is very urgent. Not all young people are clearly aware of the degree of responsibility to society when using artificial intelligence tools, which "sins" plagiarism, since the program's algorithms are aimed at extracting the necessary information from the general flow of existing knowledge on the Internet, and in this case falls on the second side of the scale, the degree of responsibility that a playwright must be aware of and bear if it is discovered that his script, created using AI, is taken in whole or in part from an already completed project that has a living author.

If everything is more or less clear with the script, and here it can be argued that artificial intelligence programs in writing a script are a kind of hint and a kind of outline, then what about the further stages of film production? And how does artificial intelligence manifest itself, for example, in the process of editing or light and color correction?

The following qualities can be identified that are suitable for the post-production stages of film production:

1.Enhanced visual effects: AI allows one to create amazing visual effects that were previously impossible.



2.Improving the filmmaking process: AI helps speed up filmmaking.

3. Personalized content: with the help of programs, one can analyze the preferences of viewers and offer them personalized content.

4.Creation of artificial actors: AI can create realistic digital doubles of actors (the ethical aspect of this point is very widely discussed, since not all actors are ready to create an artificial version of themselves).

5.Data analysis and movie success prediction: AI can analyze large amounts of data and predict which movie will be a hit based on the algorithms specified in the program.

Yet despite all these advantages, AI cannot completely replace human creativity and intuition, which are key elements of the filmmaking process.

It is important to note that the use of AI in the film industry also raises ethical and rights issues. For example, questions about who owns the rights to AI-generated content and how to protect the rights of actors to their digital images. These issues require further discussion and regulation.

Artificial intelligence can simplify and speed up the process of creating films, but it cannot completely replace humans. That's why:

- Creativity: Artificial intelligence can analyze data and identify patterns, but it cannot think creatively in the sense that we humans understand it. Here, in addition to the laid down program, intuition, emotions, and the ability to see the world outside the box are important.

- Emotional contact: artificial intelligence is not capable of emotional interaction. Of course, you might think, why is it needed when it comes to creating a script? There are very subtle matters here that are not understandable to the machine. The film is often built on emotional relationships between characters, and artificial intelligence cannot understand these relationships.

- Ethical and moral principles: artificial intelligence does not have moral principles, which play an important role in the film making process.

So, while AI can be a powerful tool in the filmmaking process, it cannot completely replace human input and creativity. Solving ethical and legal issues when using artificial intelligence in film production requires a comprehensive approach.

In the process of writing this article, teachers of the Department of Television and Media Technologies, Ass. Prof., Dr. Yusupova N.Yu. and Ass. Prof. Bazarbaev B.J., decided to conduct a practical experiment in order to identify the strengths and weaknesses of using artificial intelligence's script writing algorithms of students. A group of 20 fourth-year students was selected and assigned the task of registering in the ChatGPT and Dramatron programs in order to create

a script for their thesis. Since the selected group consisted of students currently working on their diploma films, and some of them already had ready-made scripts, this group of people was also asked to register and try to write their script again, alternatively, using AI programs and carry out comparative analysis with scenarios that they had previously created independently. Students were given 3 days to conduct the experiment, after which a round table was held at the Media Center of the Tashkent University of Information Technologies, where the positive and negative aspects of writing a script using AI were discussed. Students were able to speak about their experiences, share their impressions and give advice to those who just wanted to start writing a script.

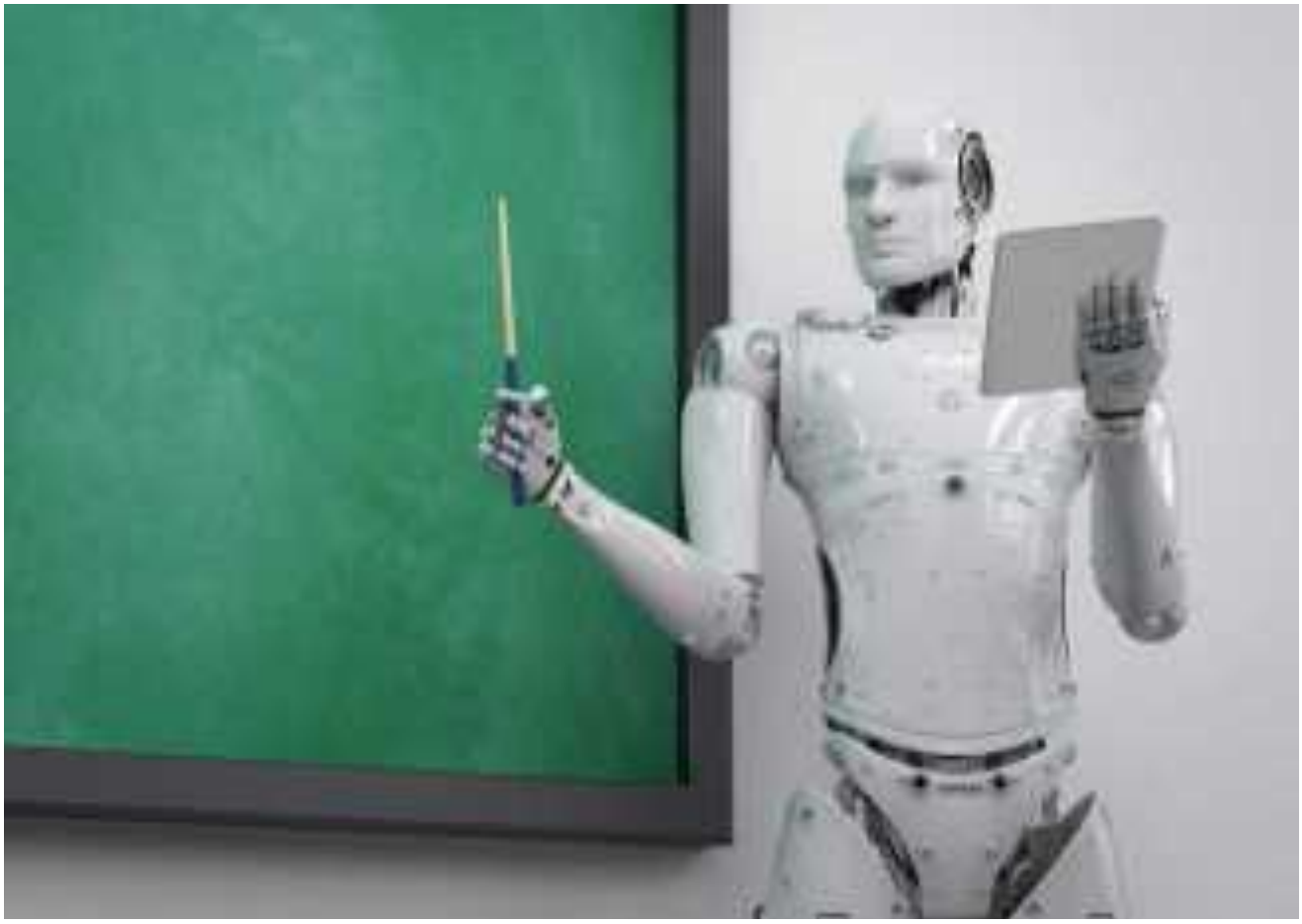
The results of this experiment were the following conclusions: A group of 4th year students, department of "Television and Media Technologies", numbering 20 people, was divided into groups that were more comfortable working with artificial intelligence programs ChatGPT and Dramatron. In the control group, the majority preferred the ChatGPT program, indicating that it is a familiar program that saves time and helps well in finding the necessary elements for the script. Those who were not lazy and registered in the Dramatron program noted that the registration process itself takes more time than working in it. It was noted that the program is very fast, again saving time, creating personalized characters, offering unexpected turning points that the participants themselves had not even thought of. However, there were also disadvantages noted. Several people noted that the characters in the scripts acted in a way that was too formulaic, and that the stories created by the program were too dry and emotionless.

In connection with the experiment, conclusions were drawn and the following proposals were outlined:

Proposals for the development of possible directions for the development of artificial intelligence in Uzbekistan: Development of regulatory rules. It is necessary to establish a system of regulatory rules, principles, and restrictions associated with the development and use of AI systems. Here, laws and regulations must be discussed and developed at the highest level that define how AI can be used in filmmaking, and what rights and responsibilities developers and users have. It is also important to protect the rights of actors, screenwriters and directors.

1. Dialogue with the public: It is important to maintain a dialogue with the public about the use of AI in cinematography. The viewer should be informed that AI programs were used in the movies, especially in creating the character of the actor.

2. Consideration of ethical principles: When developing and using AI, it is necessary to take into ac-



count ethical rules, respect for privacy, fairness, and responsibility.

3.Education and Training: There is a need to educate AI developers, users, and the public at large about the potential ethical and legal issues associated with the use of AI in film and television production.

It is important to note that these issues require further discussion and regulation at the national and international levels.

Yes, AI can be used in the film editing process. Here are some examples:

1.Automatic editing: AI can automatically sort and edit scenes based on various parameters such as pacing, mood, dialogue and even audience reactions.

2.Video Quality Improvement: AI can be used to improve video quality, including increasing resolution, improving lighting and color correction.

3.Creating special effects: AI can help create complex special effects that are difficult or impossible to create manually.

However, despite these advantages, AI cannot completely replace human involvement in the editing process. Editing is an art that requires creativity and intuition, which AI is not yet capable of fully reproducing.

AI can be used in the filmmaking process and these are already proven stages. Here are some examples:

- Filming automation: AI can automatically control cameras, lighting and other equipment on set;
- Determining the best angles: AI can analyze scenes and determine the best angles to shoot;
- Creation of virtually complex scenes: AI can help create virtual scenes that can be used instead of real locations;
- Image quality enhancement: AI can be used to improve video quality, including increasing resolution, improving lighting and color correction;

However, despite these advantages, AI cannot completely replace human participation in the filming process. Filming is a creative process that requires a non-standard approach and intuition, which are not available to artificial intelligence. Bye...

Advantage and role of liming ponds

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Liming ponds with a pendulum device

In accordance with the Decree of the President of the Republic of Uzbekistan dated August 18, 2023 No. PP-281 “On Measures to improve the procedure for using reservoirs for the needs of fish farms, as well as the development of fishing facilities and coastal tourism” the effective use of natural and artificial reservoirs when growing fish using intensive technologies requires both a scientific and practical approach.

As the country’s population grows year by year, the demand for food also increases. Fish product is beneficial for the human body, since fish meat contains 77% water, 16% protein and 5% minerals. It is quickly absorbed, and thanks to this, this product is considered dietary.

However, to meet this demand and obtain adequate profits from pond fish farming, the cultivation of marketable fish requires the use of high, efficient and scientifically sound technologies.

During the operation of ponds, the process of waterlogging occurs, the acidity of the water increases and the water regime worsens. In addition, if water is stored in a pond without drainage during the winter, food residues, dead plants, zooplankton, organic matter, excrement of inhabitants and a large amount of other waste accumulate in it. These factors ultimately lead to deterioration in the growth and development of fish.

Therefore, to improve the condition of the pond, one of the reclamation measures such as pond liming is carried out.

Amount of fertilizer applied to the pond in kg/ha

Fertilizer application date	superphosphate	lime	manure	aquatic vegetation and branch fertilizers	in kg/ha	in percentages (%)
10/V	3	3	20	40	66	2
20/V	4,5	4,5	30	60	99	3
1/VI	7,5	7,5	50	100	165	5
10/VI	15	15	100	200	330	10
20/VI	50	30	200	400	660	20
1/VII	30	30	200	400	660	20
10/VII	30	30	200	400	660	20
20/VII	15	15	100	200	330	10
1/VIII	7,5	7,5	50	100	165	5
10/VIII	4,5	4,5	30	60	99	3
20/VIII	3	3	20	40	66	2

Liming of water neutralizes soil oxidation, this leads to accelerated mineralization of substances, rapid development of aquatic organisms, loosens and improves the structure of the soil of the pond, destroys pests, and thereby creates a clean ecological atmosphere of the pond.

Therefore, liming a pond is necessary to improve water quality, which increases fish productivity. Lime normalizes the formation of the skeleton, the development of embryos, the functioning of the neuromuscular system of fish and prevents diseases of the gills.

As is known, during its life cycle, the vegetation of ponds (reservoirs) absorbs lime and releases it after it dies. Therefore, the degree of liming of the pond is determined by the vegetation in the coastal zone of the pond.

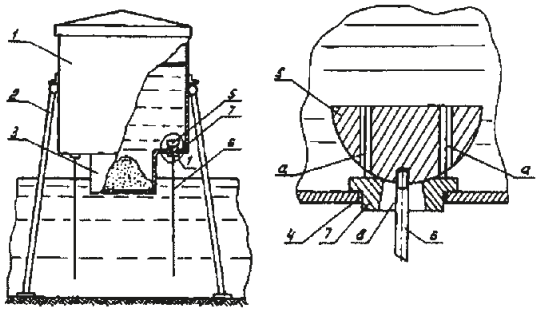
Therefore, in some cases, activating liming is sufficient, but in others, additional fertilizer must be used. Calcium is also added to the water, since during fishing, a significant part of the calcium is washed out of the pond.

Liming is carried out:

- in spawning ponds;
- in wintering ponds;
- nursery ponds;
- feeding ponds.

Liming of ponds is carried out 2 times a year, in spring and autumn at an air temperature of 1°C. Experiments have shown that the most effective way of liming ponds is a pendulum device.

The device installed under water consists of supports, a bunker with a lime receiver, and pendulums are located at the bottom of the bunker. To form milk of lime, lime is poured into a receiver and water is poured into a hopper. When the fish acts on the pendulum, lime milk pours out of the holes into the water. The pendulum device can be used to add not only lime, but also medicines and disinfectants.



Picture 1. A device for dispensing lime using a pendulum device. 1- bunker; 2- supports; 3-receiver for lime; 4- rubber gasket; 5- hemisphere; 6- pendulum; 7- washer; 8-hole.

Thus, when the fish has a need for lime, it acts on the pendulum, and the rest of the time does not swim up to the device. Therefore, adding lime using the pendulum method is safe, since an excess of lime leads to the destruction of not only zooplankton and parasites, but also negatively affects the condition of the fish in the pond.

About the relationship of Navoi and Khondamir

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Many sources have been created and are being created about Alisher Navoi, the great thinker, the Sultan of the word. Below we will discuss Khondamir, a contemporary of Alisher Navoi, who lived with him in the same environment, and his work "Makorim ul-akhlok" ("Beautiful manners") about Alisher Navoi. The Hero of Uzbekistan, Professor Suyima Ganieva, in the preface to the 2015 edition of "Makorim ul-Akhlok" by the Gafur Gulyam Publishing and Printing House, writes the following: "In 1981, the Afghan literary critic and poet Abdul Ghaffar Bayani published the full text of "Makorim ul-Akhlok" in Kabul with a brief foreword by the Minister of Information and Culture Majid Sarbalandi. The book consists of 241 pages. Khondamir's work was published in its entirety, and Bayani wrote articles about the biography and work of Khondamir in the form of separate chapters.

Khondamir's father was Khoja Gumomiddin ibn Burkhaniddin Hiravi, and his mother was the daughter of the famous historian Mirkhond. Khondamir was raised by Mirkhond. Then he was employed by Navoi and served in his large library. He was also vizier to Badiuzzaman. He prompted the scholar to write a work entitled "Habib us-siyar". In 1528, due to unrest in the country, Khondamir left for India. After seven months of difficult travel, Khondamir reached Agra. He met Babur in the Hasht Behisht garden. After Babur's death, he began to serve Humayun. He created the work "Qonuni Khumoyuniy" and achieved the title "Amir ul-Muarrihin" ("Emir of Historians"). Khondamir died in Delhi in 942 AH (1535/1536 AD). According to his will, Khondamir was buried next to the graves of Nizamiddin Avliyo and Khusraw Dehlavi near Delhi.

Orientalist Charles Rieux, author of the catalog of manuscripts of the British Museum, wrote about the sons of Khondamir: "The son of Khondamir was a contemporary of Akbar and served at his court. Akbar gave him the nickname "Khoniya". He was known as Sayyid Abdullah Khan and died in the province of Kashmir in 996 AH (1588)." Iranian scholar Said Nafisi, in the preface to Dastur ul-Wuzaro, writes that Khondamir's son, Mirmahmud, returned from India to Herat after the death of his father, or did not leave for India with Khondamir. Judging by the fact that he wrote a book about Shah Ismail and Shah Tahmasp, he was still alive 15 years after the death of his father.

A few words about Abdul Ghaffar Bayani. He was born in 1952 to the family of Mullah Abdurrahman. In 1972 he enrolled in the literary department of Kabul University. He then served in the Ministry of Radio, Television, Press, Culture and was even mayor of the city of Saripul. In 1998, Bayani was forced to leave for Tajikistan. He founded a lyceum there and taught there together with his wife Ayhan. In the summer of 2000, Bayani died in Dushanbe.

The complete text of Makorim ul-Akhlaq and the commentaries and interpretations of the work are the memory left to us by Bayani.

This book was completely translated from Persian into Uzbek by Komiljon Rakhimov.

Khondamir called his work "Makorim ul-ahlok", and one can say that this expression was mentioned in the description of our Prophet. "For Khondamir felt the purity in the personality of Alisher Navoi, in his life, work and creativity, and honored his faith."

As we have seen, Khondamir spent the main periods of his life in the circle of Alisher Navoi and the Baburids. This means that he was a direct witness to their life and work, and the legacy he left behind serves as a very important source for studying the history of our great ancestors. Therefore, we believe that getting to know "Makorim ul-akhlok" will be of great benefit to everyone who is not indifferent to the life and work of Alisher Navoi. We decided to include in this book some cases related to instances of manifestation of Navoi's noble qualities, which Khondamir himself directly witnessed. We will be very pleased if you, dear readers, like this information.

In the "Preface" to "Makorim ul-Akhlok" Khondamir, after praising the Creator, describes the great Navoi and says the following about the creation of the work: "...let it not remain secret and hidden for those with keen eyes that the sun of the sky is honor and glory, servant of the ruler of the world, the embodiment of the best qualities, the embodiment of the verses of the Merciful, the light of the blessings of the Lord, the mentor of people of knowledge and wisdom, the Kaaba of the people of truth and faith, the pillar of the state, close to His Majesty the Sultan, corre-

sponding to the words "courageous in both poverty and wealth" His Excellency Nizom ul-Khaq wa-l-khaqikat va-d-dunyo wa-d-din, Amir Alisher (may Allah rejoice his soul and increase his successes among), the light of grace and the sun of love, inspired me, a poor slave and a small particle, Giyasiddin ibn Humamiddin, known by the nickname Khondamir (may Allah improve his position and help his noble goals and deeds) for this work. [This poor servant] grew up from early childhood until the end of his youth on the banks of the stream of this master's mercy. Following the proverb, "One must thank the one who gives benefits," the thought of what kind of service I should perform in order to be able to repay some of the endless blessings he has given me has always been in my heart and in my mind.

Finally, the mind told the soul that although the glory of the great deeds and heroism of this Emir, who does good deeds, the glory of his merits and glorious deeds spread throughout the world, reached all countries and corners of the world, is passed on from mouth to mouth among different peoples, that, although according to the verse "You will recognize (see) the blessing on their faces," the rays of the Almighty Supreme Makhdum shimmer on his bright brow and according to the verse "On their faces there are traces of worship," signs of greatness and majesty are clearly visible on his happy face,

Qit'a:
The purpose of praising you is
That I wish to succeed among people of art.
On the contrary, [even without this] the qualities of the sun are known to everyone,
Why do you need makeup for a beautiful face?

If it were possible to write at least a few chapters that narrate about some of the virtues, noble and wonderful manners of this successful and happy Emir, and which describe his wonderful manners, praiseworthy manners, cases rarely found in others, interesting and amazing deeds, qualities his magical talent and comments on the peculiarities of his pen on the presentation of subtle matters on paper, you would be able to describe at least a minute of his deeds, recognize and appreciate the good deeds performed by the Lord, who guides you on the right path, you would be able to thank him a little for his good deeds, provided to them. For this work will cause reminders both before the Day of Judgment and when it comes, of the praiseworthy and good deeds of this Master.

Misra:
The great ones call a good name a second life.
Based on this, I am a servant of God who has no other ability
than to praise great art.

Bayt:
I have no other trade than praise,
I couldn't find anything good except blessings.

I began to write down what was in my heart and formed what I wrote into the form of an introduction, ten objectives and a conclusion and called it Makorim ul-Ahlok.

Khondamir's respect for Alisher Navoi was so boundless that he uses about forty different adjectives for him in the part of the work related to Navoi, or when mentioning his name. In the short passage we studied, we find the following descriptions of Navoi's personality: the sun of glory and greatness, the servant of the ruler of the world, the embodiment of the best qualities, the embodiment of the merciful verses of the Merciful, a reflection of the light of the mercy of the Lord, the leader of the people of science and knowledge, the Kaaba of the people of truth and faith, the pillar of the state, close associate of His Majesty the Sultan, "courageous both in poverty and in wealth" His Excellency Nizom ul-Khaq wa-l-khakikat va-d-dunyo va-d-din, Emir Alisher, Emir who does good deeds, successful and happy Emir, a merciful and forgiving person, a close associate of His Majesty the Sultan, a Master considered to be a close associate of His Majesty the Sultan, a wise Emir, a noble Emir, an Emir who is always accompanied by luck and victory, an Emir who has made mercy his everyday business; this high-born gentleman, the Emir, is from a family of guides on the true path; Emir, marked with royal signs; the resourceful and wise Emir, the Emir with royal qualities, the high-ranking Emir, this blessed Emir; Emir, who has commendable qualities; this high-ranking Emir, whose mouth spews jewels; the close associate of His Majesty the Sultan, the high-born Emir, the lord who is the support and refuge of the great of this world; this Emir, who has commendable qualities; magnanimous Emir; lord, source of generosity and mercy; high-ranking Emir; this Emir, possessing strength and dignity; generous Emir; this Emir, with a soul as wide as the sea; happy Emir, etc.

Here is a shining example of respect for the teacher! This is worthy of emulation.

Khondamir's second work about Alisher Navoi is called "Khulosat ul-akhbor fi bayon ul-akhvol ul-akhyor" (1498-1500). This work is also considered a very valuable source in the study of the social and cultural history of the 15th-16th centuries. This work is all the more important because it is directly related to the life and work of Navoi. In the production of music, it is especially important for us to highlight Navoi's activities in the field of music and singing. It is recognized that, along with other arts, the culture of music and singing was extremely developed in Herat. We can fully observe this in this work by Khondamir. In his work, Khondamir dedicated separate pages to the performers of melodies and singers who served at

Monument to Alisher Navoi. Soka University. Japan. 2004

the court of Hussein Bayqara. Each of the performers described on them was a famous and skilled master of his time. Alisher Navoi also had very high skill in performing music. He played the *qanun* and the *oud* with talent.

For this reason, Navoi constantly supported court musicians in their quest to improve musical knowledge and skills. In particular, Ustad Said Ahmad, who served at the court of Hussein Bayqara, with the support and patronage of Alisher Navoi, gained fame as the most skilled performer on the *gijjak*, Ustad Shahguli also played the *gijjak* masterfully. Since childhood, Navoi took care of his beloved student Shahkuli. Later, Ustad Shahguli rose to the level of a performer who could skillfully play musical instruments such as the *oud* and the *qobiz*. The work separately mentions the names of such performers as the master of playing the oud and *qanun* Ustad Hussein, the master of his time in playing the *nai* Ustad Sheikh Nayi, the incomparable master of musical art Mawlana Alishah, the master of playing the *nai* Mawlana Sultan Muhammad Khandon, the incomparable music performer Khoja Abdul Qadir Guyanda.

This work of Khondamir is invaluable from the point of view of information that Alisher Navoi was the patron of the art of music and singing, and provides valuable information about the main instruments of the 15th-16th centuries, such as *kanun, oud, qobiz, gijjak, nai*.

Ethnopsychology: healing techniques of the Tabibs and Dervishes

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Associate Professor

There are cases when modern medicine using classical methods is unable to cure any disease, and the patient is doomed. Often in such cases, they resort to the help of a healer, and in Uzbekistan, these are tabibs. And a miracle happens - the patient, who was almost sentenced to death, completely recovers after some time. This picture is often cited as an argument in favor of old, unconventional treatment methods. Rumors about miraculous tabibs quickly spread and people begin to show curiosity and the question arises: *"Where is this tabib?"* However, don't rush!!! A person uses any type of treatment for his health. In addition to modern (i.e. Western) medicine, the concept of traditional medicine (popular medicine) also exists within the World Health Organization. It contains items such as the study of traditional medicine treatment methods, their development and preservation as cultural heritage. Traditional medicine, which exists among all peoples of the world, is divided into two parts: traditional folk medicine and religious (mystical) treatment. It should be noted that traditional folk medicine is the basis of modern medicine, and includes medicinal plants, medicinal foods, treatment of fractures and dislocations of bones and other diseases without injections and chemicals.

We will talk about the second type, *religious (mystical) treatment and healing*. Historically and ethnologically, we also divide it into two types: 1. Pre-Islamic religious healing (three types: shamans, parashamans and interfaith healers); 2. Islamic religious treatment (ilmi laduni).

It should be noted that the Uzbek people have their own traditions, customs and rituals. All of them were formed on the basis of the beliefs of the people. Beliefs were strengthened and adapted depending on the economic and cultural activities of the population. Over the years, these views were absorbed into the mentality of the people and became a kind of psychology of ethnic groups. Whether we like it or not, among the peoples of the East, religious knowledge prevails over worldly knowledge. Religion is a very complex doctrine. It exists as a combination of several elements, such as religious consciousness, religious rituals (cult), religious institution or establishments.

No matter what developed society we live in, in everyday life we come across such concepts as bakhshi, duahan, parikhan, purkhan, fortunetellers, bakachi, guligir, witch, sorcerer, chopchi (parashamans), alaschi, kinnachi, kinnakash, sukchi (interreligious healers). These are concepts associated with pre-Islamic religious beliefs. At one time, they played an important role in people's lives and even determined their destinies.

And in Islam we see that they have been further developed and taken a different form. They especially refer to important persons associated with Sufism and other tariqas, to whom the population addressed: saint, azaimkhan, arbovshi, akhun, bibi, wali, dervish, duahan, ishan, qalandar, hoja, mashoikh, mullah, murid, murshid, atynbibi, pir, sayid, sufi, fakir, halfa, hafiz, sheikh.

Today you can see how they have become more active in Uzbek society. Because there are a lot of people around us who turn to tabib (all of the above concepts are now combined under the term "tabib"). Sometimes we notice that this has acquired important social significance, since such stories are given attention in domestic films, as well as Turkish TV series broadcast by state television channels of Uzbekistan. Appeals on this matter in Telegram channels, on Facebook pages and special pages of Internet sites also have a large audience. Often, regarding any religious-therapeutic issue, an appeal to the Spiritual Administration for clarification is usually addressed. For example, regarding the reading of texts during the *Chilyosin ritual*.

Chilyosin is "chikhil yasin". "Chil-chihil" means "forty" in Farsi. This is a religious custom associated with the reading of the Quranic surah "Yasin", which exists among the peoples of Central Asia. Surah Yasin is read over a sick person 40 times to rid him of his illness or alleviate it. That is, 4 times for 10 days. In fact, there is no information about Chilyosin in religious literature.

Let's pay attention to the word "Chil". It should be said here that numbers (the numbers 1, 3, 5, 7, 20, 40) played an important role in the beliefs of the people of the pre-Islamic period. The words "Chilya", "Chilyosin", "Chilton" associated with the number 40. "Chil"

Oganes Tatevosyan. The Exorcism of Demons, 1919. (Photo by Alexey Ulko)

is a number used at the most important stages of a person's life (40 days of chilli at birth, 40 days of chilli after marriage, 40 days of mourning when he/she commits a big mistake (sin), 40 days of chilla when he/she marries, 40 days of chilla when committing a big mistake (sin), 40 days of mourning If you look at the context in which it is used, it is a "period of purification or abstinence."

Of particular importance is the concept of "Chilton" (Persian-Tajik "chihilton") - the legendary 40 spirits or "forty people" who had supernatural abilities, and according to religious beliefs are invisible, inseparable mythical creatures [4, 85]. It is characteristic that the number of chiltons neither increases nor decreases. One highest spirit on earth is added to forty chiltons, and the result is forty-one chiltons. It is interpreted that Chilton, who rules the world, stands at the "navel of the earth". In the narratives, chiltons are sometimes interpreted as living among them in human form, and they are usually supposed to be found in cemeteries and similar uninhabited places. M. Andreev indicated cemeteries on the outskirts of cities, mountains and caves as places of residence for the Chiltons. Chiltons are popularly considered patron spirits and are interpreted differently in ethnographic and religious literature and articles.

According to a legend widespread among the inhabitants of the Khorezm oasis, the holy Sheikh Hussein-bobo of Khazarasp lived his life as one of the forty Chiltons. He told his children that there are actually thirty-nine Chiltons, and at different times and in different places they take one person as a friend and bring their number to 40. According to legend, Sheikh Hussein Bobo, aged 20-25, saw a group of young people sitting on the road and talking around a fire. Hussein learned that it was the "Forty Chiltons" after a conversation with them - they added him to their ranks, and from that moment his holiness and merits became known to the people.

Researcher Z. Abidova writes in her work that the habitat of the "Forty Chiltons" is located in the village of Mukhamon, Khazarasp district, and there is also *saikhon* (wasteland) called "Complex of the Forty Chiltons" on the southern side of the cemetery of Saint Kironch-bobo, a student of Sheikh Mukhtar Wali. Also, the shrine of Najmiddin Kubro in Kohna

Dervishes are musicians. Drawing by Decor (bfnk.ru)

Urganch is popularly known as a gathering place for Chiltons. In the village of Kirkop, Khonqa district, there is also a "Chiltar Bobo" mosque, and there is information that mullahs gathered there and held "sukhbati-jahr" (conversations). "Chiltar" means forty tars (musical instruments).

If we analyze the information provided, we will see that the Chiltons are associated with the dervishes of the Sufi tariqa. It appears that the dervishes adapted ancient customs to Islam. Scholars who studied the history of dervishes divided them into two groups: wandering dervishes and sedentary dervishes. According to the above information, the dervishes renounced the pleasures of the material world and devoted themselves to God and constantly wandered. There were places where they could find refuge - very abandoned places, i.e. cemeteries, cane fields around lakes and very old houses. Dervishes who lived sedentarily (they are also called qalandars) were located in mausoleums, were under the supervision of saints and obeyed the rules of society. For example, the places where they found shelter were the mausoleums of Najmiddin Kubro, Sultan Uwais, Yusuf Hamadani and Pakhlavan Mahmud in Khiva. In circles where dervishes were present, *Sukhbati-jahr* was held. The poet and historian Said Hamid Tura Kamyab, who belongs to the family of Khiva khans, writes in his work "Tawarikh ul-Khavanin" that Umar Ishan, Sadyk Ishan, Yusuf Khan Ishan, Ibadullah Ishan (from Chotkofruk), who were considered pirs and representatives of Sufism in Khorezm, Islamhodja Ishan (from Katagan), Siddiq Makhzum from Uzbekyap, Said Abdullah, Muhammad Sharif from Hazarasp, Ulugjan Ishon from Ghaziabad and his son Babajan Makhzum were invited to the palace, and, after refreshments, *suhbati-jahr* was held in the mosque. Kamyab's work also says that he visited such saints as Bakir Ishan from Khazarasp, Said Ata from Kungrad and Hakim Ata from Bakirgan, received their blessing and returned to Khiva.

The Dervishes had a "mentor-disciple" system, and they took students for themselves. The man who became a disciple joined their wanderings. It is known that Sufis treated the sick with prayer, dance and music. Dance and music are considered sunnah in Tasawwuf. They used musical instruments. So, "chiltor" also refers to Sufis. "Chiltor bobo" is a dervish who heals with music.

Medieval Muslim peoples looked at dervishes as divine healers. Even the dervishes themselves believed in this and considered themselves healers. Dervishes also had methods of treatment. Let's touch on some of them to get an idea of dervish medicine. To heal the wounds of dervishes during a trance, the sheikh recited prayer and rubbed the wounded place with his saliva. But this method of treatment was applied only to dervishes who permanently lived with the sheikh. Another method was used for the people. For example, in Turkey or Egypt, when the dervish-

es performed *zikr*, mosques or halls were filled with sick people there were also women among them. They came seeking healing for themselves or their children. At the end of the *zikr*, the sick were laid on the floor in front of the sheikh. The sheikh circles around the patient, then he gets up and takes the sheikh by the hand, and the supernatural power contained in his hand heals the patient. In Turkestan, not only sheikhs, but also dervishes treated the sick. They placed their hands on the patient's head, read a magical prayer and breathed on his face and sore spots. They often used spells and magic. They were usually written down on paper. Along with these pieces of paper, the patient was given a number of recommendations. Such pieces of paper were kept in gold or silver cases, others wore them tied on their hands, others wore them on hats, some wore them around their necks, and others sewed them to their underwear.

We examined the history of religious-mystical treatment using the example of the history of the dervishes. Their unusual methods of treatment initially met with great resistance from Islam. However, since the capabilities of traditional medicine are limited to treating the body, the population could not refuse mystical treatment. In fact, the difficult life and troubles of life led to that mental illness has come to the forefront among people.

Today, among any segment of the population, you can find many people turning to religious and mystical treatment. There is even a process of healers gathering at one table. Modern medicine is also not against spiritual healing. However, it is observed that people's views in the field of medicine are returning to the level of the 19th century. "Here it is worth mentioning the types of diseases for which people turn to religious and mystical medicine: the evil eye, demonic possession, witchcraft, even cancer and diabetic diseases. Treatment methods: writing verses of the Quran, folding paper into different geometric shapes, hanging on one of the parts of the body or sewing on clothes, burning something, beating, observing abstinence (chill). Exactly like the methods of the dervishes. The most severe of them is "witchcraft" (in fact, a mental disorder).

Most of the world's discoveries concern the material world, only a small percentage concerns the spiritual world. Authors have written a lot about the power of words. There are many reports from the past about people with divine abilities. However, they had thorough religious and secular knowledge. Abu Rayhan Beruni said that he dedicated his work "Astrology" (Tafhim) to the daughter of his friend, Tabib Rayhana. According to available data, Beruni was accused of witchcraft. Beruni does not deny the possibility of knowing divine knowledge, but to do this, he wrote that it is necessary to be able to accurately determine geometric figures, mathematical calculations, connection lines and angles of spatial bodies with objects on the ground. Religious sources require purity of soul and renunciation of worldly matters and pleasures in order to acquire divine abilities. Today it is impossible to find such an ideal person. Self-proclaimed tabibs force the patient to believe in what he wants to believe. There are two reasons for this: the first is economic necessity, the second is the superficiality of the religious and secular knowledge of the population.

Traditional treatment (herbsinasia.com)

Horizons of pilgrimage tourism in Uzbekistan

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In Uzbekistan, pilgrimage tourism is developing as an important segment of general tourism. This is positively influenced by a number of factors and the opportunities available in the country. It is necessary to distinguish between external and internal factors in the development of pilgrimage tourism. External factors include, firstly, the increasing number of people professing the Muslim religion year by year, secondly, the formation of a middle class in Islamic enclaves in European countries, as well as in Asian countries where the majority of the population is Muslim, such as Malaysia, Indonesia, Pakistan and Bangladesh. As a result, they have a growing desire to visit Islamic shrines, the graves of scholarly people and saints who made a unique contribution to the development of Islam, Islamic artifacts, and a huge cultural heritage, while the financial opportunities for this also increase. As for internal factors, a legal framework for this area has been created by the Presidential Decree "Concept for the development of the tourism sector in the Republic of Uzbekistan for 2019-2025", approved by Resolution of the President of the Republic of Uzbekistan No. PF-5611 dated January 5, 2019, "On measures for the further development of domestic and pilgrimage tourism in the Republic of Uzbekistan" dated February 9, 2021. The development strategy "Uzbekistan – 2030" is aimed at increasing the number of tourists in the field of pilgrimage tourism to 3 million.

In accordance with this Decree, a number of benefits were provided and conditions were created for the development of domestic and pilgrimage tourism. In particular, the government was instructed to develop a procedure for reimbursing part of the costs of travel in Uzbekistan, extending weekends in connection with religious and secular holidays, increasing air, rail, and bus services throughout the country, and measures were taken to improve the living conditions of travelers. The International Islamic Academy of Uzbekistan, the Silk Road International University of Tourism, the Tashkent State Economic University, Bukhara, Urgench and Termez State Universities have launched a system of training undergraduate and graduate students in the field of pilgrimage tourism.

Pilgrimage tourism also means "religious tourism", "spiritual tourism". They are often used interchangeably. Pilgrimage tourism is a relatively new concept and primarily reflects "spiritual rest" rather than physical (physiological). Pilgrimage tourism plays an important role in the formation and strengthening of the national idea and unity as an integral part of the sustainable development of tourism in our country.

It is known that on the territory of Uzbekistan there are more than 500 monuments and historical places associated with the development of various faiths - Islam, Christianity (Orthodoxy and Catholicism), Judaism, Buddhism, Zoroastrianism. This is a serious basis and opportunity for the development of pilgrimage tourism.

The name of the great scholar Imam Bukhari, buried near the city of Samarkand, is known throughout the Islamic world. Imam Bukhari, the author of the authentic collection of hadiths "al-Jami' as-Sahih", which is the second main source after the Holy Quran, is praised as the "Sultan of Muhaddiths" throughout the Islamic world. A visit to the tomb of Imam Bukhari, the necropolis complex of the Shahi-Zinda tombs has become familiar to every Muslim. Currently, on the

Kalyan Minaret. Bukhara

Barak-khan Madrasah. (pac.ru)

initiative and under the ideological leadership of the President of the Republic of Uzbekistan Shavkat Mirziyoyev, a huge and majestic complex is being built here.

Also in Samarkand, the grave of Khoja Daniyor and the Hazrat Khizr mosque are considered holy places.

Such shrines include memorial ensembles with the graves of such saints as “Seven Pirs” in Bukhara, Hakim at-Termizi and Isa at-Termizi in the Surkhandarya region, Sufi Olloyor, Hakim ota in Karakalpakstan, Zangiota near Tashkent.

Pilgrimage is one of the oldest forms of travel and has a spiritual basis.

Derived from the word “Ziyarat” (Arabic: زيارة - “ziyara”), it usually means visiting holy places. The word “pilgrim” in Latin means “a monk traveling the world.”

So, pilgrimage is a person’s journey to various holy places to perform religious rituals. We are talking

Shahi Zinda Complex, Samarkand

Religious – memorial complex of Imam Al-Bukhari. Samarkand (islom.uz)

Samanid Mausoleum, Bukhara

about pilgrimages to religious or secular holy places far from their permanent place of residence. The external form of pilgrimage serves as the basis of pilgrimage tourism. Thus in the process of external pilgrimage, the journey is to visit holy places. This form of pilgrimage helps people achieve spiritual and physical maturity. Based on this, the pilgrimage can be divided into two parts: religious and secular.

The first is based on divine values, and the second is based on universal human values.

Religious pilgrimage, in turn, is divided according to religious views characteristic of Islam, Buddhism, Christianity and Judaism.

If religious pilgrimage involves visiting holy places and performing prayers there, then secular pilgrimage is expressed in visiting and appreciating natural, historical and vital sites.

A secular pilgrimage is a journey closely related to the education of a person. On the day of "Memory and Honor," the secular pilgrimage can include laying a wreath at the statue of the "Mourning Mother" and visiting the Memorial Complex "In Memory of the Victims of Repression" in Tashkent.

Pilgrimage tourism has great social and spiritual significance. Visiting holy places allows a person in an industrial society to enter into dialogue with his spiritual experiences. Pilgrimage tourism creates favorable conditions for family reunification, promotes social growth, the development of human solidarity, brotherhood, and the restoration of man as an individual. This leads to a reduction in class and racial stratification and the disappearance of existing risks.

Thus, pilgrimage tourism leads to the strengthening of spiritual values; it should be taken into account not only as a recreational factor in the physical (physiological) sense, but also as a factor in the development of human dignity.

That is why the importance and scale of pilgrimage tourism are great, and it will continue to remain one of the most developed segments of tourism.

Those who come to visit holy places, of course, do not limit themselves to visiting the graves of saints. They visit other noteworthy historical and cultural sites and architectural monuments of cities, and also learn about the lifestyle of local residents, traditions, customs, immortal values and modern life. They use urban and intercity transport and communications. They eat national dishes, buy various souvenirs and national costumes. Thus, the economic and financial significance of pilgrimage tourism is also great.

Pilgrimage tourism, of course, is difficult to distinguish from other types of tourism. Because visitors come solely for the purpose of pilgrimage. At the same time, among ordinary tourists interested in business trips, history, economy, culture of the country, as well as among visitors to congresses, there are many people visiting religious sites - mosques, madrassas, *saganas* and mausoleums. Most visitors to the city of Tashkent do not leave without visiting the Hastimom (Hazrati Imam) complex. So, the main criterion here is the purpose of the visit.

In recent years, a number of measures have been implemented in Uzbekistan to develop pilgrimage tourism as a branch of general tourism, strengthen its material and technical base, create infrastructure, and provide the industry with personnel of medium and high qualifications. The mausoleums of our great ancestors, who made a great contribution to the development of Islam, were improved, mosques and madrassas, special hotels for pilgrims were built, and gardens were created around them. Literature in this area is published, documentaries and feature films are created, scientific research is conducted and dissertations are defended.

In Uzbekistan today, more attention is paid to the development of Islamic culture (civilization) than ever before. The creation in Uzbekistan of scientific and educational institutions, such as the International Islamic Academy, the Center for Islamic Civilization of Uzbekistan, the Tashkent Islamic Institute, the Mir Arab Higher Madrasah, is evidence of the creation of schools of hadith, qalam, and jurisprudence.

Islam is an educational religious teaching created in the 7th century in Hijaz (Arabian Peninsula), which spread over vast territories and is steadily developing on our land. Islam gave impetus to the development of not only religious, but also secular sciences. During the Eastern Renaissance in the early Middle Ages, all areas of science rapidly developed, including exact and natural sciences - mathematics, physics, astrono-

Miri-Arab Madrasah, Bukhara

Kalyan Mosque, Bukhara

my, geology, mineralogy, botany, chemistry, medicine and others. During this period, such globally recognized polymaths as Muhammad Musa Al-Khwarizmi, Ahmad Fargani, Abu Nasr Farabi, Abu Rayhan Beruni, Ibn Sina became famous. Imam Bukhari's collection Al-Jami'as-Sahih was recognized as the most reliable source after the Holy Quran in the Islamic world. This is the first of the "Sihah al-Sitta" (Six Authentic Collections) on the science of hadith known in the Islamic world, and Imam Termizi's book "Sunan al-Tirmidhi" is also one of the famous collections of hadith. Also Burkhoniddin Marginani, who made a great contribution to the development of Islamic jurisprudence, Imam Moturidi, who created a separate school of theology, the great jurist Abu Lais Samarkandi, Mahmud Zamakhshari, the predecessor of tafsir, adab and linguistic sciences, Abdukholik Gijduvani, who achieved a high rank in Sufism, Ahmad Yassawi, Najmuddin Kubro, Bahauddin Naqshband, Khoja Akhror Vali, Makhdumi Azam and Sufi Olloyor made a great contribution to the development of Islam with their faith, valuable works and exemplary educational views. Because these great thinkers integrated the Islamic faith with the life of the people, our country constantly enjoys these wonderful manifestations of cultural and spiritual life. To establish high Islamic morality inherited from our ancestors, to continue living traditions imbued with the spirit of Islam, in the conditions of the 21st century, a lot of serious work is being done in our country today.

For this purpose, an electronic comprehensive platform for pilgrimage tourism has been created at the International Islamic Academy of Uzbekistan on the basis of a state grant. The platform's website, mobile application, audio and video downloads are dedicated to more than 100 main shrines of our country, including the photo album "Pilgrims of Uzbekistan". The objects were selected taking into account their international and national scale, history, significance, infrastructure and other conditions. Using an electronic platform, a package of information about pilgrimage tourism sites was created, a mechanism for using innovative factors in organizing pilgrimage tourism was created, and maps of pilgrimage sites were prepared. In collaboration with official organizations, a single comprehensive register of all sacred places, unique objects, cultural and spiritual resources of Uzbekistan has been created based on international experience and their description based on accurate historical materials.

In addition, the Academy is creating a multi-volume "Encyclopedia of Islam" and Wikipedia dedicated to religious and educational topics. The main principle adopted in the articles of Wikipedia, considered the "Encyclopedia of Islam" and a free encyclopedia, is to provide the reader with scientific and accurate information based on reliable sources. The views and approaches in the information presented in them try to be based on primary sources and to be as impartial as possible to the views and historical events of any person, sect or movement. All this undoubtedly serves to expand the possibilities of pilgrimage tourism in Uzbekistan.

Khalifa Niyazkul Madrasah (Chor Minor). Bukhara

It is no coincidence that this holy land, which gave birth to the above-mentioned great saints, attracts foreign tourists, especially pilgrims.

Miniatures of Transoxiana in the collection of the Marjani Foundation

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Shihabuddin Marjani Foundation for the Support and Development of Cultural and Scientific Programs was founded in Moscow in 2006. One of the activities of the Foundation is collecting objects of Muslim art with the subsequent goal of creating a museum of Islamic art in Russia. Over the years, the art collection of the Marjani Foundation has reached about 16,000 items, among which the art of Uzbekistan occupies a significant place, including a medieval collection, decorative and applied art of the 19th century, and painting of the 20th century. Miniatures of Transoxiana, 16th – 17th centuries are few in number relative to other sections of this collection, but each of them is a real pearl of the art of its time and reveals little-known aspects of the art of that era.

The manuscript of "Bustan" by Saadi (IM/R-3) was created in Transoxiana in the 1500–1520s and is illustrated with seven full-page miniatures. Although the compositions are, in general, very simple, with a small number of characters, the exquisite style of rendering human figures, the individuality of persons endowed with psychological traits, in the manner of execution are close to the outstanding artists of the Herat school of the 15th century. The miniatures of this manuscript belong to the initial stage of the formation of the Shaybanid artistic style based on the achievements of Herat. In terms of size, format, page design, type of handwriting and small-figure compositions of miniatures with flat gilded backgrounds, the manuscript is similar to the list of "Fath-name" (Book of victories of Sheibani Khan) by Mulla Muhammad Shadi (Institute of Oriental Studies of the Uzbekistan Academy of Sciences, Inv. No. 5369), dating back to approximately 1507 CE. Similar miniatures are also found in Kulliyat-i Navoi (Russian National Library, Dorn 559), created for Muhammad Keldi Khan, ruler of Shahrukhiya, in 1522.

Particularly noteworthy is the miniature depicting a feast in the garden of the padishah of Yemen from the story of Hatem's generosity (fol. 15). The padishah sits on a purple rug with an ornament in the form of small gold crosses. A very similar rug depicts Badi al-Zaman at a feast taking place in the garden, in a miniature from the "Kulliyat" of the Navoi National Library (fol. 137 rev.). These two characters are similar in facial features, and at the same time both are similar to the portrait of Sheybani Khan, attributed to Behzad and dating from about 1508 (Metropolitan Museum, No. 57.51.29). Probably, it was Sheybani Khan who was implied in the guise of the ruler in both manuscripts. The scenes unfolding around the central figure of these miniatures are very similar in terms of the landscape depicted, the set of characters, and everyday details. The ruler's entourage includes people wearing turbans and felt caps of steppe dwellers. While listening to chang and doira, the rulers eat and drink on gold and silver dishes. The lawn around Badi al-Zaman is entirely gilded, and the king of Yemen is placed on a green flowering lawn, but his status is emphasized by a gold crown (the black finial was

The garden feast of the King of Yemen. Miniature in the manuscript of Saadi "Bustan». Average Asia. The first half of the XVI century. Paper, paints, gold. 21.5 x 13.5 cm (size manuscripts). IM/R-3, l. 15

Portrait of Uzbek Muhammad Khan Shaybani (d.1510)

added later) and a gold outer robe lined with ermine fur. This outstanding detail is all the more noticeable since the rest of the characters are dressed very modestly - in simple robes without patterns. Only one of them wears an outer patterned caftan with short sleeves (*kaba*) over a robe. The miniatures from this manuscript are related in style to Shahrukhiya and complement the small group of miniatures from this center still known.

Other miniatures in the manuscript illustrate a game of equestrian polo, the dance of dervishes, disputes with a judge and in the palace, the execution of criminals, and the battle between the Iranians and the Mongols. In the miniature illustrating the defeat of the Iranian army from the Mongols, warriors with sabers, wearing helmets, riding horses covered in armor, are fleeing from the steppe inhabitants in simple shaggy hats. The artist's sympathies, in contrast to the poet Saadi, are clearly on the side of the Mongols, whose descendants the Sheybanids were considered.

All compositions of the miniatures are quite standard and go back to the Herat and Shiraz prototypes. At the same time, the simplest architectural forms and carelessly executed ornaments contrast amazingly with the magnificent quality of gilding, which would later become an important feature of the Maverannahr school of painting under the Sheybanids.

The exquisite ornamental headpiece that opens the text of the manuscript is typical of Transoxiana at the end of the 16th – beginning of the 17th centuries. It was probably added at the same time as the gilding of the initial spread of the text. Later several owners of the manuscript left notes and impressions of their seals on it. The earliest available seal contains the name of Ali-Taqi Najafi and is dated 1138 AH / 1725-6. Later the book came into the hands of Sayyid Khair ad-Din Shah (1797-1812) - the nawab of the Kalayan region, subject to the Nizams of Hyderabad. The worn seal of this owner bears the date 1212 AH/1797–8, corresponding to the beginning of his reign. Apparently, it was to India at the turn of the 18th – 19th centuries. These include ornaments on the last page and in the titles of chapters of the book.

In the mid-1560s under the patronage of Khan Abdullah II, the Bukhara palace kitabhane (library-workshop) experienced a heyday, marked by the production of many illustrated and richly decorated manuscripts. The sheet with the text of Abd ar-Rahman Jami from the poem "Tuhfat al-Ahrar" ("Gift to the Noble") and the miniature "The Flight of the Turtle on the Ducks" (IM/R-39) is a classic work of this time. The high quality of calligraphy and the richness of the decorative design of the sheet correspond to the best manuscripts of this workshop. However, the laconic style of painting differs from the multi-figure compositions, overflowing with details, commissioned by the khan himself. The composition is built from four plans. The foreground is silver, conveying the surface of the water with ducks swimming on the surface and diving into the depths. The second shot is of the ground with a group of people looking up. Next is the gold of the mountainous distance, against which one can see a yurt with a man and a woman in front of it, also looking up.

And above there is a blue sky with the main characters of the plot - a turtle and the ducks carrying it. A harmonious composition, free from secondary details, clearly conveys the meaning of the parable, forcing you to focus on the main idea - the value of silence. Almost all of the people depicted froze, pressing a finger to their lips in a symbolic gesture of surprise and at the same time silence. Only one of the characters in the background turns to his neighbor with a gesture of conversation, but in response, the elder presses his finger to his lips, asking for silence.

This page comes from an anthology of poetry compiled by Nizam ad-Din Amir Ni'matullah, known as the Mir of the Caliph, and transcribed for him by the calligrapher Ali Riza in 972 AH/1564–5. The manuscript of the anthology consists of 103 sheets and 23 miniatures, was sold at auction in Paris in 1992. An article by A.S. Melikyan-Shirvani in 2000 is devoted to a detailed study of this manuscript. The manuscript includes excerpts from famous Sufi poems. In addition to Jami's texts, it includes poems by Saadi, Attar,

Lovers. The artist Muhammad-Muqim Samarqandi. Miniature from the manuscript "Dovalrani and Khizrkhan" by Amir Khosrow Dehlevi. Salar Jung Museum (Hyderabad), No. 148/XVIII, l. 61 vol.

and Nizami. The design of the sheet in question coincides with the design of the anthology sheets. The style of the miniature is close to the miniatures of the manuscript, especially the illustration to Saadi's parable about the kind man who gave water to a dog in the desert. The story of the flight of the turtle is also included in the anthology, but there is no illustration for it. In its current form, the manuscript does not contain a single illustration of "Tuhfat al-Ahrar", despite the fact that the anthology includes as many as three excerpts from this poem.

The laconic style of the miniature could meet the ascetic tastes of the customer of the manuscript. Mir Khalifa served as keeper of the seal at the court of Khan Abdullah II and carried out particularly important state assignments, such as the construction of a large religious complex at the grave of the Naqshbandi sheikh Abu Bakr Sa'ad. As Hafiz-i Tanish Bukhari writes, "With sincerity, exceptional frankness, he considered himself among the murids and followers of Khoja Juibari." Illustrative program of the Anthology, transcribed by A.S. Melikyan-Shirvani, has a pronounced Sufi character and is dedicated mainly to the exaltation of Sufi modesty, restraint, and self-denial as opposed to the luxury of the court. The miniature depicting the flight of a turtle on ducks corresponds to this program.

There are several monuments in the collection of the middle - second half of the 17th century that characterize the new flowering of Bukhara miniatures at this time, which has so far been little studied by art experts. The connections between the art of Transoxiana and Mughal India become especially noticeable. The Great Mughals, a dynasty of descendants of Timur who were forced out of their historical homeland, so actively cultivated Muslim art and culture in their new homeland that the 17th century became the century of Indian style in literature, fine arts and ornamentation, if not of the entire Muslim East, then of its eastern half, including Iran and Transoxiana, displacing Iran from its traditional position of cultural leader. Mughal artists were the first to master some of the techniques of European painting, such as light and shadow modeling of faces, perspective in architecture, and naturalistic rendering of plants. The appearance of similar details in the miniature of Transoxiana is associated with the movement of famous masters of painting from India to the court of the Bukhara khans.

The miniature in an album frame, "Women cut their hands at the sight of the beauty of Yusuf" (IM/R-53), apparently once served as an illustration of the manuscript. It captures the moment when Yusuf appeared before the resting women in Zuleikha's house. He is depicted in the lower right corner in the foreground of the action, and the women show a wide range of reactions when they see him. The most famous literary adaptation of this plot, which was most often copied and illustrated, was the poem by Abd ar-Rahman Jami "Yusuf and Zulaikha". Our miniature could belong to this text, but the same story was told and illustrated, for example, also in Gazurgahi's Majalis al-Ushak.

It is noteworthy that Yusuf is depicted here without the flaming halo above his head, with which he is traditionally marked in Muslim painting. The artist focused on the emotional content of the scene, bringing the religious plot closer to the realities of palace life, easily recognizable by contemporaries.

Many details of this miniature, such as the specifically interpreted forest in the background, the abundance of naturalistically depicted Indian fabrics, and

Sheikh Arif Azari talks with Mirza Ulugbek. Artist Farhad (?). Miniature from the manuscript of Kamal al-Din Gazurgahi "Majalis al-Ushaq" ("Meetings of lovers"). Commissioned by Abd al-Aziz Khan. Bukhara. 1650s. Paper, ink, paints, gold. 25 x 16 cm.

Women cut their hands at the sight of Yusuf's beauty. The artist Muhammad-Muqim Samarqandi (?). Miniature. Bukhara. Ca. 1670. Paper, paints, gold. 22.5 x 14 cm.

the characteristic, almost portrait faces of the characters, refer to Indian painting. However, the specific features of the women's costume - round caps with black aigrettes, similar to skullcaps - and the high conical crown on Yusuf's head indicate the Central Asian origin of the miniature. Similar headdresses, although differing in the manner of execution, are, for example, worn by the characters in the illustrations of the manuscript PNS 66 from the Russian National Library, dated 1648. The closest image to the image from the collection of the Marjani Foundation is a miniature placed in the manuscript of the poem "Davalrani and Khizrkhan" by Amir Khusrav Dehlavi from the Salarjung Museum and signed by Muhammad Muqim Samarkandi. R. Skelton dates this last miniature to about 1670. According to researchers, the artist Muhammad Muqim Samarkandi first worked in Kashmir, and then went to serve the Ashtarkhanids in Bukhara. He was one of the bearers of the influence of Indian painting in miniatures of Bukhara.

A miniature on a sheet from the manuscript of Kamaladdin Husayn Gazurgahi "Majalis al-Ushak" ("Gathering of Lovers") ended up in the collection with the code name "The Sheikh Instructs the Young Man" (IM/R-78). Scattered leaves from this manuscript, originating from the collection of the French diplomat and collector Jean Pozzi (1884-1967), appeared at many European auctions and were distributed to various collections, including, for example, the Museum of Islamic Art in Doha (MS.172.2007) and A. Sudawara Collection. Many of the miniatures are signed by the artist Farhad, others are exactly the same in style and brushwork. Yves Porter devoted a special article to these sheets, suggesting that the customer of this manuscript was 'Abd al-Aziz, Khan of Bukhara (1645–1680). At the time of publication of the article in 1997, the author counted 9 miniatures. Since then, several more have appeared on the art market, including our miniature.

The characters depicted in the miniature can be identified by the title located on the back of the sheet - "Seventy-fourth Majlis". After this we talk about Mir Alisher Navoi. This means that the miniature and the verses surrounding it refer to the previous seventy-third Majlis, which talks about Sheikh Arif Azari. The name Azari is also mentioned in the verses below the miniature. It is also written on the miniature itself in the book in the hands of the elder.

Sheikh Arif Azari is also known as Azari Tusi, and also as the poet Nur ad-Din Hamza ibn Malik Esferaini Baykhaki (1382–1462). He spent the first part of his life as a poet at the court of Timur and Shahrukh, then took the path of a Sufi dervish, performed the hajj, received sheikh initiation, served for some time as a poet at the court in Deccan, and then returned to his native Esferain and spent the last thirty years of his life like a hermit.

But who is the young man sitting in front of him in a golden caftan and turban, with a black feather in his headdress?

The work "Majalis al-Ushak", created in 1502–3 at the court of the Timurid prince Sultan Husayn Bayqara, is a collection of stories about outstanding historical figures for whom love in earthly life opened the way to the knowledge of God. The author of the essay associated the name of Sheikh Arif Azari with Mirza Ulugbek, the grandson of Amir Timur, the ruler of Samarkand and the famous astronomer. "Meeting Seventy-Three" begins with a description of the con-

Defeat of the Iranian army by the Mongols. Miniature in the manuscript of Saadi "Bustan". Central Asia. The first half of the 16th century. Paper, paints, gold. 21.5 x 13.5 cm (the size of the manuscript).

versation between Sheikh Azari and Ulugbek in Mashhad. Having explained his pseudonym with a witty impromptu, the sheikh earned the favor of the prince. What follows is an amazing story about the spiritual power of a sheikh, who at a distance forced a young shoemaker to inflame with love for himself and take the path of truth.

The precious clothes and aigrette of the young man in the miniature indicate his royal origin. His gilded clothing surpasses in luxury the costumes of all other characters in the known miniatures of this manuscript. It is unlikely that an artist would depict a young shoemaker in such clothes, despite all his spiritual perfection. In addition, an important point in the story about the young shoemaker is the indication that when he came to the sheikh's house, he spoke to him while standing. Later illustrators showed this conversation exactly this way. Most likely, the miniature depicts a conversation between Sheikh Azari and Ulugbek. Legends about the connection between these two personalities are captured not only in the work of Kamal ad-Din Gazurgahi and, apparently, by the 17th century were widely known. In 1487, Daulatshah of Samarkandi in "Tazkere ash-shuara" outlined another legend about the relationship between the sheikh and the prince, referring to the story of Sheikh Arif Azari himself.

Daulatshah's story is distinctive in that it gives precise dates for two meetings between these two individuals. At the first meeting, Mirza Ulugbek was only three years old, but Azari was only a fifteen-year-old boy who was entrusted with entertaining the child. At the last meeting, a year before the death of Ulugbek, Azari was already a famous sheikh, but the elderly ruler did not conduct a spiritual conversation with him, expected in such a situation, but recalled the days of his youth.

Kamal ad-Din Gazurzgahi, who wrote his work only 15 years later than Daulatshah, freed the story of Azari and Ulugbek from life details, leaving in it only a typical meeting of a sheikh with a royal person, during which two intellectuals talked about poetry and the Sufi path, using alphabetic allegories. It is clear that this meeting could have taken place when Azari had already become a sheikh, but Ulugbek's age is not clear from the text. This gave the artist, who lived two and a half centuries later, the opportunity to interpret the plot in the most familiar way for himself and the viewer: in the miniature, a young prince visits a gray-haired old man. Other illustrations of the manuscript were designed in the same spirit. At the same time, the bowed figure of the elder and the lowered sleeve of his robe are conventional gestures of humility before the interlocutor. This pose also plays off Azari's impromptu statement given in the text: "The letter "zal" from the month of Azar (the pen name of Azari by birth in the month of Azar - G.L.) was in the parking lot of humiliation for years, so that his back bent." The young man's pointing finger makes it clear that he is taking an active intellectual part in the conversation and asking questions. This is not a lesson, but a mutual exchange of wisdom between those depicted.

Creative activities of the Jazzirama group

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We often see jazz music described in scientific journals as "World Art" and "Jazz knows no boundaries." But we don't always think deeply about what these phrases mean. These expressions were first used in America, the birthplace of jazz, at the beginning of the last century, when American journalists used them to describe the developing art form. But today the expression "jazz knows no boundaries" is used in a completely different sense.

It is based on attempts begun half a century ago to find answers to questions like "Can representatives of other regions play jazz like Americans?" or "Should they imitate the Americans?" Despite the fact that a lot of time has passed since the beginning of these discussions, a clear answer to them has not yet been found. In general, the performing skills of musicians from different countries in jazz music can be divided into two types: on the one hand, the performers have developed the skills of performing jazz classics, which became part of jazz standards, and on the other hand, each musician tried to find his own individual path in jazz. They tried to combine the American canon, instilled through the educational system of jazz music, and their personal "baggage," a musical style that was different from America. We can find confirmation of the above in the performances of jazzmen from all over the world at the annual April jazz concerts. Representatives of the various regions that have created jazz standards through their distinctive musical styles also perform jazz works that are unlike any other. For example, as part of the jazz festival from April 30 to May 12, 2022, the American ensemble "Ginetta's Vendetta", Igor Butman's own orchestra and the Moscow Jazz Orchestra from Russia, the ensemble "Gregory Privet Trio" from France, Agi Zaryan and Mikal Tokay from Poland, Hayk Grigoryan Quintet from Armenia, "Bennyand The Jazz Collective Benedict Lazarus" from India, Malcolm Braff and Claire Ugenin from Switzerland, as well as ensembles from Slovakia, Germany, Hungary and Great Britain shared their performing skills in concert programs and master classes.

It would not be an exaggeration to say that the Jazzirama ensemble, which synthesizes the music of two regions and performs in several countries around the world with its works in the ethno-jazz genre, is an ensemble of performers of new times, testifying to the development of jazz music in Uzbekistan. Current performers of the ensemble: saxophonist Saidmurad Muradov and pianist Sanjar Nafikov formed the group in 2013.

Ensemble leader Saidmurad Muradov describes the purpose of creating the ensemble as follows: "As students at the Uzbek State Conservatory, we performed in various ensembles, but unlike others, Sanjar Nafikov and I really liked listening to jazz and synthesizing it with Uzbek national music. Therefore, the main goal of our ensemble was to create Uzbek ethno-jazz ."

S. Muradov is the founder and leader of the group, graduated with a bachelor's and master's degree from the Uzbek State Conservatory, is a laureate of international jazz festivals organized by UNESCO, and a laureate of the ArtsLink international scholarship. He spent 2 months improving his qualifications at the Michigan Music University in the USA, and in 2016 won a grant at the French Institute. S. Muradov conducted a research of the work of the great French singer Henri Salvador, and also twice gave solo concerts with French jazz performers in Paris. In these concert programs, works created in the genre of ethno-jazz were performed, where Uzbek national musical melodies were synthesized with jazz. Among them, "Lazgi", "Waltz" by Manas Leviev, "Chaikhana" by Farrukh Zakirov, "Otmagai Tong (May the night never end)" by Jalilov, which were interpreted by S. Muradov in new

"King Oliver's Creole Jazz Band" performed in Chicago in 1923.

The Jazzirama Group

jazz arrangements. Of particular note is his multifaceted organizational and creative activity as a band leader, producer and arranger, as well as a saxophone solo performer.

The main members of the Jizzirama group are Sanjar Nafikov (piano), Shavkat Matyakubov (vocals, also plays *surnay*, *koshnay* and sato), Andrey Sfirnov (bass guitar), Vladislav Nimtinov (drums), *maqom* performer Dilfuza Nurmetova, Nadira Pirmatova, *doyra* performer Gulyamjan Mukhammedjanov. The group includes universal performers who perform not one, but several tasks, for example Sanjar Nafikov not only plays the piano, but also creates arrangements and compositions for the group. And Shavkat Matyakubov has established himself as a versatile musician, performing at concerts in several European cities singing *maqom* and playing national musical instruments such as *surnay*, *koshnay* and *sato*.

According to the leader of the group, there are two types of creative roles for the Jazzirama group. The first is creative work on the synthesis of the traditions of East and West. The second is related to performing practice - the Jazzirama group shares its creative innovations with the public in the Maqom restaurant, the name of which would seem to contradict its activities. As an example of the first type of activity, we can cite arrangements of Uzbek national folk music in the jazz style: "Lazgi", "Otmagai Tong ", "Chaikhana" and other works. In the second activity of the tour, band members perform works in the genres of jazz, funk and pop. The group's repertoire highlights compositions that have become jazz standards: "Fly me to

Joseph Holston "Jazz at Tacoma Station" (www.aaac.com.au)

the Moon , “Summertime”, “Sway”, “Caravan”, “Feeling Good”, “Round Midnight”, as well as funk and pop compositions “Get Lucky“,”No Roots“, “Perfect”, “Freedom”, “Stay with me”, “Uptown Funk”, “Crazy”, “Happy”, “Shape of You”, “Rock with you”, “New rules”, “Bad guy” and other very popular works.

As we noted above, the group is engaged in the synthesis of Uzbek national melodies into jazz music, creating compositions in the style of ethno-jazz. Having familiarized ourselves with the musical notation of the arrangements of this group, we noticed that each instrumental track was created differently from the written large scores. It is interesting that in these arrangements the duration of performance of all instruments is not recorded, but fixed on one instrumental track, just like in a schematic arrangement. The fact that the ensemble performers create such sketchy arrangements suggests that the group members understand each other well throughout the performance. For this reason, they also do not require a notated part from the accompaniment player. An example is the arrangement of the melody “Lazgi”, which invariably captures the attention of listeners during foreign concerts and is the pride of our national music.

Of course, one of the band’s most successful aspects lies in their mastery of improvisation. Internationally recognized Russian jazz journalist Kirill Moshkov on his website “Jazz.Ru” highly appreciates the piano improvisations of Sanjar Nafikov and the improvisations of Saidmurad Muradov on the saxophone. Among the musicians from many countries who participated in the 2013 Jazz Festival in the capital of Kyrgyzstan, one of the journalists was interested in the performance of the Jazzirama group and spoke highly of the compositions “Lazgi” and “Sogdiana”.

We believe that the main reason that this group stands out among many jazz performers and is able to interest a wide public in its creative work is that the musicians have both practical and theoretical knowledge. The reason is that very talented jazz improvisers who do not have deep theoretical knowledge and the art of improvisation find it difficult to create memorable and vibrant works that do not tire the listener. One of the most difficult tasks of jazz music is to find a compromise between freedom and systematicity. The talented performers of the Jazzirama group manage to find this golden mean.

The exhibition of heritage of Uzbekistan in China

Akmal Ulmasov,
PhD (in Architecture)

Color-painted Warrior Head. 1st century BCE – 1st century CE. Collection of the Fine Arts Institute, Uzbekistan Academy of Sciences

Cultural ties between Uzbekistan and China go back to ancient times. The trade route, which went down in history as the Great Silk Road, united China and Central Asia and created the basis for the spread of religions, culture and art, customs and traditions over a vast territory. These ties are actively developing today. On the initiative of the Foundation for the Development of Culture and Art under the Cabinet of Ministers of the Republic of Uzbekistan, an international exhibition dedicated to the 10th anniversary of the international project "One Belt, One Road" was organized in 2023 at the Palace Museum of Beijing, the capital of China. The exhibition, which was held under the title "Cooperation in the field of cultural heritage and archaeology," featured more than 80 rare exhibits from China, Uzbekistan, Kazakhstan and the United Arab Emirates.

The palace museum where the exhibition was organized is located in the Forbidden City (Gugong) located in the center of Beijing, that is, among the palaces and other buildings of the era of the medieval emperors of China. China presented at this exhibition unique finds discovered over the past decade and today stored in more than 13 different museums in the country. These include a carved stone block associated with Zoroastrianism, a tricolor bowl of Poseidon, a terracotta lamp with a male figure, gold items found in the deserts of Central Asia, blue and white porcelain items found on the Arabian Peninsula, and more.

It is noteworthy that at this exhibition, two stone blocks returned from the USA in 2023 were presented to the public for the first time. These rare 7th century CE sculptures were cut from the tomb in the 1990s and smuggled out of China. They were purchased by Shelby White, a private art collector from New York, and were transferred to the Metropolitan Museum of Art after a criminal investigation began in 1998 until they were confiscated by prosecutors. One of the stone blocks was made during the Northern Ji and Sui dynasties. Elaborate scenes related to the altar are carved on its surface, which not only shows the high creativity of the ancient sculptor, but also expresses the sacred meaning of the sacred fire in Zoroastrianism and creates a deep sense of grandeur, giving it a spiritual refuge. On both sides of the block there is a carved scene depicting the struggle of the god-king with a demon, holding a weapon in four hands and trampling the demon with his feet. According to researchers, this type of composition "sacred fire sacrificial altar and priest", which appeared in China, probably originated from the compositions of terracotta masters found in the Sogdian historical and cultural region of Central Asia (http://cn.obj.cc/article-18948-1.html).

"The Forbidden City in Beijing

Compositions "Sacred fire sacrificial altar and priest". Carvings from the 7th century.

Among the exhibits, special attention is drawn to a camel with a saddle bag depicting Dionysus dating back to the Sui Dynasty (581-618). This ceramic statue of a Bactrian camel may be a rare example of a Chinese-style tomb in eastern Central Asia. The identity of the central figure of the composition is unknown. He may represent Kubera, who is considered the Yaksha king of India. Another interpretation of the scene is that the composition of the three figures may have been inspired by images of the Descent from the Cross, an important theme in early Christian iconography along the Silk Road.

At this exhibition, the Republic of Kazakhstan presented unique artifacts found in the Saka burial mounds on the territory of the Issyk Museum-Reserve by a joint Kazakh-Chinese archaeological expedition. In particular, among the exhibits are elements and items of clothing of the famous "Golden Man", found in the grave of a Saka warrior of the 5th-4th centuries BCE. These finds testify to the history and culture of the peoples who lived on the territory of Kazakhstan in ancient times.

The great merit of the scientific and restoration laboratory "Island of Krym" under the leadership of the Crimean restorer Altinbekov, famous not only in Kazakhstan but also abroad, was in sending to China objects and other exhibits related to the world famous "Golden Man", which was also exhibited in Uzbekistan. The laboratory's restorers take part in excavations of unique historical and cultural objects discovered during all archaeological expeditions in the country, and work professionally on their chemical preservation in the field and processing in the laboratory before sending them to exhibitions. The most important thing is that laboratory specialists, in collaboration with archaeologists and art historians, managed to reconstruct many exhibits and exhibit them in many countries around the world. In this regard, the contribution of Krym Altynbekov and his team can hardly be overestimated.

Uzbekistan brought about 20 unique artifacts to this exhibition; they were selected from the archaeological collection of the State Museum of History of Uzbekistan and the Institute of Art History of the Uzbekistan Academy of Sciences. These include ceramics and objects from the Kushan era, examples of clay sculptures, terracotta figurines, architectural decorations, metal incense burners and glass vials. They belong to different periods and were found mainly in monuments located in the Surkhandarya region.

It is important that almost all the exhibits selected for the exhibition from the Institute's collection were sent abroad for the first time. Among them are archaeological objects presented to the public for the first time. An example is a fragment of a capital depicting the Garuda bird, discovered at the Buddhist

The Palace Museum. Beijing

site of Karatepa. This limestone sculpture is considered an architectural decoration and depicts the legendary bird Garuda with his wings spread. Among the unique items, a bronze incense burner with a handle made in the shape of a deer deserves special attention. This find was discovered in the archaeological site of Dalvarzintepa, and similar samples were not found not only in the Surkhandarya oasis, but also in Central Asia. However, similar metal censers were found in large quantities in Gandhara and Parthia, historical and cultural regions adjacent to Bactria at that time. Although they are similar in form and function, their handles differ in the depiction of different animals.

In total, the exhibition presents three fragments of sculptures depicting a head. The oldest of them was discovered in Khalchayan, dating back to the 1st century BCE – 1st century CE and represents the head of a warrior in a helmet. The head belongs to a middle-aged man, wearing a helmet, with a round face, with slightly narrowed eyes, prominent cheekbones, a thin mustache and a thick beard. Based on the strong expression of emotions in such Khalchayan sculptures, researchers have put forward the opinion that they depict real people. The remaining two head images also date to the Kushan period (1st-3rd centuries), one, found at Karatepa, represents a female image, and the other, from Dalvarzintepa, a Bactrian goddess. The base of the sculptures is made of clay, and the surface is covered with a layer of stucco and painted in different colors. The head of a woman found in the temple at Dalvarzintepe is depicted life-size. Compared to the other statue fragments, she is wearing a white dress with a red robe over it. The size of the statue and other details indicate that it was the main figure in a group of statues, probably depicting a seated goddess.

In short, although the origin of the historical objects presented in the exhibition belongs to different historical and cultural regions of Asia, there is an affinity between them. This closeness lies, first of all, in the fact that they come from the same region, but is manifested mainly in the interaction of artistic traditions of the Great Silk Road, as well as religious and philosophical similarities. Such exhibitions serve to open up historical spaces for the exchange of ancient civilizations. Also, thanks to new projects, today the opportunities for developing cultural cooperation between peoples are expanding.

Color-painted Goddess Head. Khalchayan. 1st century CE. Collection of the Institute of Art History, Uzbekistan Academy of Sciences

Photo archive of the Kunstkamera: in focus the history and culture of Central Asia in the 19th - early 20th century

Alisher Egamov,
Researcher at the Center for
Islamic civilization in Uzbekistan

The photo collection of the Museum of Archeology and Ethnography (Kunstkamera) in St. Petersburg is a collection of unique photographic materials reflecting the cultural history of various regions of the world at the end of the 19th century – early 20th century. A significant place in the fund is occupied by a collection of thematic photographs dedicated to the history of Central Asia.

The photo archive of the Kunstkamera includes the following materials: paintings, drawings, prints (engravings, printed drawings, printed or copied on stucco, plaster, paper), consisting of collections and entire albums, glass negatives, film, photographs and congratulatory letters (postcards). Samples with pictorial properties consist of 550 collections (about 50,000 copies).

Among the photo albums about the peoples of Central Asia, it should be noted "Turkestan Album" by Alexander Kuhn, photo album by G. E. Krivtsov "Categories and Images of the Khiva Khanate", "Categories of the Peoples of Central Asia" by V. Kozlovsky, photo collections by N. Orde, S. M. Dudin, K.V. Shennikova, drawings of national ornaments by S.M. Dudin, A. Voronina-Utkina, album of watercolors by A. Pomerantsev.

The illustrative fund about the peoples of Central Asia has been formed over the course of a century and a half. The first illustrative collections arrived at the museum in different ways. In some cases, photographs were acquired by accident. Some illustrative collections were acquired by the museum, and also received as a gift from private collections and organizations, and later the fund was replenished as a result of expeditions. Thematically, the collection of illustrations is diverse and can be divided into the following conditional groups:

- representatives of the main (Uzbeks, Kazakhs, Kyrgyz, Turkmen, Tajiks) and minority peoples (Shugnans, Yaghnobs, Dungans, Jews, Gypsies, Uyghurs, etc.) living in the territory under consideration. The local population was photographed under normal conditions, in national costumes that determined their ethnosocial origin. The fund contains portraits of khans, beks, clan elders, religious figures, representatives of local government, artisans, national theater artists, men, women and children;
- traditional way of life associated with the economic activities of the population, crafts, trade and everyday life, cultural objects;
- everyday, historical and cultural events of the region;
- auls and villages, dwellings, vehicles;
- items related to religious culture, religion, applied arts, national patterns, musical art, etc.

This fund contains photographs taken at the end of the 19th century – early 20th century, showing festive portraits of ordinary people of Central Asia and representatives of the ruling class of society - Bukhara emirs, Khiva khans, their associates and family members. Not all photographers had the right to photograph the local nobility. For example, among the archival documents of the Kunstkamera there is a certificate of a photographer working at that time, who received special permission to photograph the Bukhara emir in St. Petersburg.

The desire of photographer G.E. Krivtsov in the summer of 1872 to take up photography in the Kokand Khanate and the process of photographing Khudoyar Khan for the "Turkestan Album" were reflected in a newspaper advertisement (Turkestanskie Vedomosti 1873. No. 6). Perhaps this event, in turn, could awaken interest in photography among the nobility of the region. The activities of G.E. Krivtsov interested the Khudoyar Khan and his son, the Bek of Andijan. At the request of the khan, G.E. Krivtsov drew up instructions on photography for Berdykul, who specially came from Kokand to study photography, taught him how to use a camera and sent photographic equipment with all the necessary materials to Kokand and Andijan. Three months later, a letter addressed to G.E. Krivtsov arrived in St. Petersburg. The letter talks about the first experiments in photography in Kokand. In it, the khan and his son express gratitude for the "machine for photographing the human face" sent to them, although they note that Berdykul's first attempts at photographic portraits were not satisfactory (Turkestanskie Vedomosti 1873. No. 9).

In 1874, the museum's collections received the first illustrative materials about the peoples of Central Asia. These include the photo albums "Turkestan Album" and "Categories and Images of the Khiva Khanate." Thanks to the photographs in these albums, you can obtain important information about the political situation, lifestyle, culture and art of the peoples who lived in Central Asia in the second half of the 19th century.

For example, the photograph entitled “Punishment” of a page on the topic “Muslim School” (Col. I-674-67-71), presented in the “Turkestan Album”, has the character of a kind of staging. A stick is tied to the feet of the offending student. A teacher with a stick in his hand is about to punish the culprit. However, from the look of the student, who is comfortably leaning against the wall of the house and looking at the camera with interest, it is felt that he is posing for a photographer. On the other hand, this photo is an illustration of teaching methods in local schools.

In 1924, photographer S.M.Dudin made copies of 250 previously unexposed glass negatives related to the “Turkestan Album” in the photo laboratory of the Kunstkamera. The collection contains negatives of photographs of Uzbeks, Tajiks, Kazakhs, Central Asian Jews, and Karakalpaks.

The series of photographs depicts the religious rites of Uzbeks and Tajiks (crafts, weddings, women), Kazakhs (weddings), Central Asian Jews (weddings). A significant part of the materials is devoted to the traditional occupations of nomadic and sedentary populations, the photographs depict tools, the process of grain processing (milling, mills and designs of local threshing machines). A significant part of the negatives contains images associated with various professions, crafts and trade. In those days, many market stalls served as workshops (sewing workshop, lathe workshop, blacksmith shop, shoemaker shop, etc.) and sold handicraft products.

The photographs from the section dedicated to the craft of making carts - arba, show two types of carts: Kokand and Bukhara arbas, as well as the stages of assembly and production of their components. Part of the collection is devoted to the processing and use of reed, which was considered a building material. Reeds were widely used to cover the roof of a house, build walls, and weave mats used in everyday life. The images show the process of making tandoors and ceramic household items by a potter.

Types of nationalities of the Turkestan region. Uzbeks. Mullajan Turdi Ali, uncle of the eldest son of the Kokand Khan. Turkestan Album, Part 1. Ethnographic (drevlit.ru)

Pupils are in school. Karakalpakstan, Uzbekistan, the first third of the 20th century. Turkestan Album, Part 1. Ethnographic. (drevlit.ru)

Photographs of professions and crafts include images of candle making, soap making, butter making and bread baking, snuff making, processing cattle hides, the work of blacksmiths and degreasers, and the process of marketing their products. The negative collections show images of metal vessels made of red and yellow copper, common among the local population. A separate part of the negatives is devoted to traditional occupations of the population, such as weaving, yarn production, silk production, wool processing and carpet weaving. Some images are related to folk theater, the photographs depict clown troupe artists and theatrical costumes.

In 1894 and 1897, a collection of about 300 unique photographs dedicated to the peoples of Central Asia was acquired for the museum fund. Based on the available documents, we can say that this collection came from the photographer N. Orde. N. Orde is considered the only photographer who in his time worked in the direction of multifaceted compositions. From his travels in Central Asia, Orde brought back photo-

Sale of shaniraq. Turkestan Album. The commercial part, (drevlit.ru).

graphs that were unique in content and technically perfect. The pictures by N. Orde related to the Bukhara Emirate, stored in the Kunstkamera, are the first images of the types of the country. The photographs show national clothing, houses, the daily activities of the rural and nomadic population, the life of small peoples. A series of photographs by N. Orde consists of portraits of the Khiva khan, Bukhara emirs, their relatives and their associates. According to information, Orde came to Bukhara in the 1880s, won the trust of the Emir of Bukhara and his officials, photographed the Emir's associates, his relatives and Emir Adulahad Khan himself.

One of his photographs shows a Dungan family from Gulja in national costumes. In the 1870s, the Dungans fled from several Chinese provinces and settled in the cities of Central Asia, escaping government persecution. In order to more fully represent the life of the peoples of Central Asia, N. Orde creates compositions from several paintings depicting various objects that he combines by topic. For example, "Weapons", "Tools", "Shoes" and others. One of these photographs is called "Samarkand. Toys of Sart children." The photo shows the toys of city children. There were no special craftsmen for making toys, but some craftsmen (carpenters, joiners, potters, etc.) occasionally made toys. Toys were sold by retailers, and sometimes they made the toys themselves.

The formation of an illustrative collection of the peoples of Central Asia in the Kunstkamera is associated with the activities of the famous collector, photographer and artist S.M.Dudin. In 1893, S.M.Dudin and historian, academician V.V.Bartold visited Samarkand. S.M. Dudin took several photographs of the city of Samarkand and left comments on them. In 1905-1917, Dudin donated negatives with samples of stucco carvings on the doors of palaces and mosques in Kokand, Andijan and Samarkand to the museum fund. He also donated photographs depicting Uzbek, Turkmen and Afghan carpets to the museum. In 1917, Dudin transferred a photographic collection of Central Asian carpets, kept in personal collections in Petrograd, to the museum fund. The photographs presented by Dudin are distinguished by their scale. Dudin also captured destroyed tiles and parts of the historical and architectural monuments of Gur-Emir and Bibi-Khanum in Samarkand. The photographer took a photo of a door installed in the Gur Emir mausoleum and decorated with exquisite examples of wood carving. This damaged door was later taken to St. Petersburg and is now stored in the Hermitage.

Even a brief overview of the unique photographic archive of the Kunstkamera concerning our region testifies to the important role photographic documents play as a source on the history and culture of the Uzbek people at the turn of the 19th – 20th centuries.

Muslim school. Punishments (hitting the palms or feet with a stick) Turkestan Album, Part 1. Ethnographic (drevlit.ru)

Funeral customs. Tajik funeral. The procession. Turkestan Album, Part 1. Ethnographic (drevlit.ru)

Many rocks, including those at depth that are the target of Chan'e-6, should come directly from the lunar mantle and be of great scientific value for studying the past of the Moon and the Solar system. Next steps. The sending of Chan'e-6 to the Moon was carried out using the Changzheng-5 rocket, the largest and most powerful launch vehicle at China's disposal, from the Wenchang Satellite Launch Center, the most modern and southernmost at China's disposal. The rocket was necessary because the probe, weighing 8,200 kg, is one of the heaviest cargo ever launched from China to the lunar surface. From the moment of launch to the return of the samples to Earth, 53 days will pass. If everything goes according to plan, it will be by this time that the main mission of Chan'e-6 will end. The descent to the Moon's South Pole is expected to take place at the end of May, but we are waiting for official news. After this, Chan'e-6 will have to collect samples of lunar soil and subsurface samples and deliver them to Earth.

Source: New-Science.ru https://new-science.ru/startovala-missiya-chane-6-ona-vpervye-soberet-obrazcy-na-obratnoj-storone-luny/

The Chan'e 6 mission has launched. She will collect samples on the far side of the Moon for the first time

On May 3, 2024, the Chan'e 6 mission, the sixth mission in China's current lunar exploration program that began nearly seventeen years ago, successfully launched from the Wenchang Satellite Launch Center aboard a Changzheng 5 launch vehicle. The goal of the mission is to go to the far side of the Moon, which we never see, take samples of rock and dust from the surface and return them to Earth. This is the first attempt in human history to extract samples from the far side of our satellite. The nominal duration of the mission will be 53 days, from launch to return to Earth. This is one of the most ambitious lunar robotic missions ever attempted and will go down in history. Chan'e-6, a historic mission Chan'e-6 was originally built as a backup vehicle for Chan'e-5, whose mission took place in 2020. The changes made were due to a completely different landing area and method of collecting samples. Everything else remains more or less the same. The landing site and collection of samples will be a real feature of the mission: until now, only China, during the Chan'e-4 mission, managed to control the probe on the side of the Moon hidden from us, but it did not go that far to the south. Chan'e 6 will attempt to land in the Aitken Basin at the South Pole, a particularly interesting area that covers much of the hidden side of the Moon. This area is especially interesting because, as a lunar basin, it is located at a low altitude, meaning it is on a fairly thin layer lunar crust.

Parrya tojibaevii D.A. German & Madaminov A - general view, B - structure flower head, structure C - leaf structure, D - type of stem.

Landscapes of distribution of Parrya tojibaevii (in the area the confluence of the Chatkal River into the Charvak Reservoir)

A new species of plants of the genus Parrya has been discovered in the flora of Uzbekistan

Scientists of the Institute of Botany of the Uzbekistan Academy of Sciences F.M. Madaminov, N.Y. Beshko and a well-known scientist specializing in cabbage (Brassicaceae), a lead specialist of the South Siberian Botanical Garden D.A. Gherman discovered a new species of the genus Parrya R.Br.

Samples of the new species were first discovered on May 6, 2023 during scientific field research conducted by D.A. Gherman and F.M. Madaminov on the slopes of the Chatkal ridge in the Tashkent region, near the Charvak reservoir, at an altitude of 900-1000 meters. The populations of this species, discovered as new to science, correspond to the territory of the Ugam-Chatkal State National Natural Park and are located around the "Obirahmat" natural monument.

This plant species, taking into account the great contribution of the director of the Institute of Botany of the Academy of Sciences, Academician K.Sh. Tajibayev, to large-scale studies of the flora of Central Asia, conducting research on a new generation of the flora of Uzbekistan, organizing the protection of rare and endangered species on a scientific basis, as well as the development of a number of similar areas, was named - Parrya Tojibaevii D.A. German & Madaminov.

Detailed scientific information about Parrya Tojibayevii has been published in the prestigious Phytotaxa journal (https://doi.org/10.11646/phytotaxa.633.2.5) and is placed in the International Index of Plant Names (https://www.ipni.org/) as a new biological species for science (https://www.ipni.org/n/77334280-1).

41 species of the genus parrya are known to science, distributed in Northeastern Europe, Russia, the Far East, Central Asia and the Himalayas. Uzbekistan is one of the centers of species diversity, with 18 species registered in the country. Most of them are considered rare species. Parrya Tojibaevii differs from existing closely related species (Parrya gracillima and Parrya mollissima) in the morphology of the flower head, reddish color and shape of the leaves located on the stem.

Currently, there is no information about the biological and beneficial properties, chemical composition of the new plant species. Preliminary research results show that its natural range is quite narrow and it grows in areas with a high level of anthropogenic impact. Currently, our scientists are conducting research to include it in the next edition of the Red Book of Uzbekistan in order to preserve the populations of this plant species.

The new plant species, which is another example of fruitful research conducted by scientists of the Institute of Botany in the framework of international cooperation to create new editions of the flora of Uzbekistan, shows that the rich composition of the flora of the territory of Uzbekistan and its various regions are still the site of many biological discoveries on a global scale.

Book album
Academy of Sciences of the Republic of Uzbekistan
Editor-in-chief President of the Academy of Sciences of the Republic of Uzbekistan, academician B.S. Yuldashev

Fan Publishing House. 2023

This book-album is dedicated to the 80th anniversary of the establishment of the Academy of Sciences of the Republic of Uzbekistan. The book describes the history of the creation in 1943, the further formation and development of the Academy of Sciences, the largest scientific organization of the Republic of Uzbekistan. The publication contains extensive information about various periods of activity of the Academy of Sciences of Uzbekistan in the war and post-war years, in the period before 1991 and during the period of independence of the Republic of Uzbekistan. The data on the most important scientific developments, research results and achievements of scientists from more than 30 research institutes and centers, museums and three regional branches of the Academy of Sciences of Uzbekistan for the period from 1943 to 2023 are presented. The book provides information about the activities of the Academy of Sciences of the Republic in recent years, as well as about the structural composition and human resources, research and innovative developments, unique scientific facilities and material and technical base, and the development of international scientific relations of the Academy of Sciences. The album book also contains contact, address and reference information about research organizations that are part of the Academy of Sciences of the Republic of Uzbekistan. The anniversary book has been published in 1000 copies and is of interest to researchers, statesmen, historians and the general public of the Republic of Uzbekistan and foreign countries.

The book-album is published as a single colorfully illustrated volume with a dust jacket containing identical texts in Uzbek, English and Russian.

B.T. Ibragimov, Kh.U. Khojaniyazov, J.M. Ashurov
Diclofenac supramolecular and mtal complexes

«Yosh avlod matbaa» Publishing house. 202 1

This monograph was prepared and published by lead specialists of the Academician A.S. Sadykov Institute of Bioorganic Chemistry of the Uzbekistan Academy of Sciences. The monograph discusses questions of the synthesis of supramolecular compounds based on diclofenac, its molecular and crystal structures, as well as chemical properties are described. The main goal of the monograph is to show, using the example of diclofenac, that the solubility, biological activity and other properties of drugs in water can be improved by obtaining supramolecular compounds (salt, cocrystal, solvate, metal complex), as well as reducing their side effects. The monograph is intended for scientists, specialists and university students in the fields of chemistry, biology, pharmacology and medicine .

The monograph was published in Uzbek.

M. M. Mirsaidov, T. Z. Sultanov
Seismic strength of hydraulic structures

Publishing house MASHHUR-PRESS. 2023

This textbook was prepared and published on the basis of Resolution No. PP-144 "On measures to implement the Decree of the President of the Republic of Uzbekistan dated May 30, 2022 "Further improvement of the system for ensuring seismic safety of the Republic of Uzbekistan." The textbook examines the physical nature of earthquakes, the occurrence and assessment of its seismic impact, and provides general information about the negative consequences of earthquakes. At the same time, the main attention is paid to modern theories, models and calculation methods aimed at assessing, increasing and ensuring the seismic resistance of structures, the seismic strength of structures and the implementation of anti-seismic measures. This textbook is intended for undergraduate specialties: 60730900 – Hydraulic engineering; 60531000 – Mechanics and mathematical modeling; 60710800 – Hydropower; 60730300 – Civil engineering: construction of buildings and structures; as well as master's specialties: 70730901 - Hydraulic structures; 70730902 – Hydraulic structures and underground hydraulic structures; 70730903 – Construction of hydroelectric power stations and pumping stations; 70730308 – Construction of earthquake-resistant structures, as well as for other construction specialties intended for university students and undergraduates. In addition, the textbook provides scientific data in the field of research into relevant problems in earthquake-safe construction. The textbook will also be useful for doctoral students, independent researchers and practicing engineers working in these areas.

The textbook was published in Uzbek.

Akhmadali Askarov
Ancient Turan, the Eneolithic, fragments from the history of civilizations of the Bronze and Early Iron Ages.

Fan Publishing House. 2023

The monograph contains fragments of the history of the most ancient civilizations that existed on the territory of modern Uzbekistan, associated with the epoch of the Eneolithic, Bronze and Early Iron Ages. This period entered world history under the name of the primary civilization of the Oxus. Historical sites of this period are represented by hundreds of archaeological sites in the Zaravshan and Kashkadarya valleys, Southern Uzbekistan, Ancient Khorezm, Ancient Fergana, Tashkent oasis and Ustrushan. The spiritual and ideological culture, socio-economic foundations, lifestyle and ideological views of the peoples of ancient Turon are shown through a comparative study of ancient written sources. The popular presentation shows the formation of the Uzbek ethnic group from the 2nd millennium BCE, as a people formed by the ethnic mixing of the local population with thousands of proto-Turanian nomadic pastoral tribes who came to the territory of Movarounnakhr from the northeastern regions of the Syr Darya, and also describes the historical roots of the formation of the first states, which date back to the Bronze Age. This monograph is aimed at forming a correct scientifically based perception of history among a wide readership.

The monograph is published in Uzbek.

Good old Mickey Mouse

Exactly 96 years ago, the premiere of the film “Steamboat Willie” took place in a New York cinema, which introduced the general public to Walt Disney’s greatest creation.

The character’s path to the top of popularity was not strewn with roses: Mickey had his ups and downs, and an extremely difficult start, but nine decades later he is still fresh, cheerful and ready for new achievements. And we invite you to take an excursion into the almost century-old history of the character and find out what adventures he has already experienced.

Mickey Mouse is one of the most famous characters in the world. His popularity is so high that his name is constantly mentioned and quoted in other works of popular culture, and is included in voting ballots. When the Allies landed in Normandy in June 1944, the password that distinguished friend from foe was Mickey’s name. The mouse became the first animated character to receive his own star on the Hollywood Walk of Fame, constantly serves as a source of new ideas in fashion, animation and literature, and almost every person has T-shirts with his silhouette in the wardrobe.

Birth

In the mid-twenties, the company of the young animator Walt Disney created a series of short cartoons about Oswald the Rabbit for the Universal studio. The popularity of the character exceeded all expectations, and then film producer Charles Mitz decided to independently develop the popular hero. Since the rights to Oswald belonged to Universal under the contract, Mitz stopped further cooperation with Disney and transferred work on the new series to the animators of his own studio.

However, Disney was not going to give up. During a four-day train ride, the cartoonist came up with a new character - a mouse named Mortimer Mouse. Disney’s wife Lillian convinced her husband that the name sounded too arrogant, and by the end of the long journey the mouse changed his name to “Mickey.” Together with Ub Iwerks, Disney set to work, and soon the first short film featuring the new character was ready - the animated film Airplane Crazy.

With the advent of television, Walt Disney very quickly recognized the prospects of the new medium and was again one of the first to use it. For the first time, viewers were able to see at home all the old cartoons featuring Mickey, which had previously only been shown in movie theaters, and in 1955, Disney created the children’s show “The Mickey Mouse Club,” which aired for several years and was then regularly revived in different eras and with by different actors. For example, in the early nineties, thanks to The Mickey Mouse Club, Britney Spears, Christina Aguilera, Justin Timberlake and Ryan Gosling first appeared on the screen.

Also in 1955, the first Disneyland theme park opened, where visitors were, of course, greeted by Mickey Mouse. Mickey posed for photographs, commanded parades on national holidays, and generally did whatever was required on behalf of the company.

In 1983, Mickey appeared on the big screen for the first time in thirty years, playing the title role in Mickey’s Christmas Carol, a half-hour adaptation of Charles Dickens’ famous story A Christmas Carol.

In 1988, Mickey made a cameo appearance in the Robert Zemeckis comedy Who Framed Roger Rabbit, sharing screen time with his longtime rival Bugs Bunny. And this is not a joke - so that both characters could appear in the frame, Disney and Warner Bros. signed a special agreement ensuring that both characters would receive equal screen time.

https://ast.ru/news/nnn-m11-y18-istoriya-mikki-mausa-ko-dnyu-rozhdeniya-znamenitogo-myshonka/

Popular gadget of the 1990s (Tetris)

Tetris is a computer game originally invented and developed by a Soviet programmer. Now the game is implemented on almost all modern computers, mobile phones, game consoles, TV-sets (as an additional feature), as well as many handheld gaming devices.

History of creation

The game was created in 1984 by Alexey Pajitnov, a Russian programmer. He developed it while working at Dorna. The game was originally developed for the Electronics 60 series of computers, popular in the Soviet Union. The name «Tetris» comes from the Greek word «tetra», meaning «four», as all the blocks in the game are made up of four squares.

The rights to the game were licensed to Nintendo in 1986, and it became one of the most popular and successful games for the Game Boy handheld console. In the following years, the game was released on most gaming platforms and received huge success around the world. Thus, Tetris became one of the most famous icons of video game culture and remains popular to this day. At the same time, the implementation of Tetris for the GameBoy game console and the NES game console (with its numerous clones) gained the greatest popularity.

Description of the toy

Tetris is a popular game in which the player controls falling geometric shapes (called tetrominoes) and arranges them to create horizontal lines without gaps. When the horizontal line is full, it disappears, making room for the next shapes. The object of the game is to fill the lines to prevent reaching the top of the playing field. The game has simple rules, but at the same time requires quick reactions and strategic thinking from the player. The game continuously increases the speed at which the tetrominoes fall, making the gameplay more difficult.

The original version of Tetris had monochrome graphics and a simple sound effect, but subsequent versions of the game added a variety of features, including music, different difficulty levels, multiplayer mode, etc.

New Age

Some people think that Tetris is a thing of the past. But many people forget that the new is the well-forgotten old. In 2019, a multiplayer Tetris game called Tetris 99 appeared on the NintendoSwitch console. A multiplayer element was the ability to “throw” incomplete rows of cells into the glasses of other 98 participants while collecting points until all but one lose. In the USSR, the most popular portable gaming system was from Nintendo. It was the most convenient and compact, helped brighten up leisure time and was convenient for transportation, as it easily fit in a pocket. Today, for kids, you can find wooden panels with figures similar to Tetris. Thus, the child will be able to arrange the wooden figures on the panel in a certain way in order to fill the entire field or build an intricate pattern.

Production

Brick Games is one of the leaders in Tetris sales on the Russian market. This toy will be a wonderful gift for children from the 90s, as a surprise from the past will definitely cause a storm of positive emotions.

https://www.i-igrushki.ru/igrushkapedia/tetris.html

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The miniature was created by an unknown artist in 1425-1450. Freer Art Gallery, Washington

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