

International University Science Forum



SCIENCE EDUCATION PRACTICE



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The collection includes scientific articles of participants of the International University Science Forum, the purpose of which is to present significant results of scientific research in the field of humanities, natural and technical sciences; the formation of a modern level of scientific knowledge, experience in transformation of theoretical science into the sphere of practical application of innovations; generalization of research and practical experience. The forum is a tool for establishing sustainable ties, as well as the exchange of experience between teachers and researchers of universities and research organizations.

Le recueil comprend des articles scientifiques des participants du Forum Scientifique International des Universités, dont l'objectif est la présentation des résultats significatifs de la recherche dans le domaine des sciences humaines, de la nature et de l'ingénieur; la formation du niveau contemporain des connaissances scientifiques, de l'expérience de la transformation de la science théorique au champ de l'application pratique des innovations; la synthèse de l'expérience des recherches scientifiques et pratiques. Le forum est un instrument permettant d'établir des liens durables et d'échanger des données d'expérience entre les enseignants et les chercheurs des universités et les organisations scientifiques.

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ANALYSE ET ÉVALUATION DE LA SÉCURITÉ ALIMENTAIRE DANS LA RÉPUBLIQUE AUTONOME DU NAKHITCHEVAN

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L'article révèle l'essence socio-économique de la sécurité alimentaire. L'article examine les moyens d'assurer la sécurité alimentaire en tant que domaine clé de la sécurité économique et nationale. L'article étudie les enjeux de la sécurité alimentaire de la région NAR, puisque la transformation, la production et la vente des produits agricoles sont des maillons clés dans le domaine de la sécurité alimentaire, ces enjeux sont analysés de près. L'article fournit des informations sur le travail accompli pour créer une sécurité alimentaire testée et sûre basée sur l'expérience internationale. L'article analyse et évalue la sécurité alimentaire, met l'accent sur le développement du secteur agricole dans le NAR et les questions qui jouent un rôle clé dans ce développement.

Mots clés: alimentation, assurer la sécurité alimentaire, analyse, évaluation, agriculture, secteur agricole.

Assurer la sécurité alimentaire dans notre pays fait partie intégrante de la sécurité nationale et économique. Fournir de la nourriture à la population est le principal intérêt de l'État et l'un des problèmes économiques et sociaux importants. La solution à ce problème englobe des facteurs économiques, sociaux, nationaux, démographiques et environnementaux. À cet égard, les systèmes économiques et sociaux de l'État sont liés à la sécurité alimentaire. Par conséquent, la sécurité alimentaire est basée sur la mobilisation des ressources nationales. Ces approches sont associées à l'élaboration d'une stratégie économique nationale, à la création et à l'utilisation de normes juridiques efficaces, au développement durable et à de nombreux changements pour améliorer les conditions de vie de la population. Les observations montrent qu'il y a eu des changements importants dans les besoins, les préférences et les goûts de la société. Mais même aujourd'hui, l'un des principaux problèmes des agriculteurs

est le manque d'informations. Le manque d'informations sur où cultiver, comment et combien vendre, à quel prix, sur les moyens de circulation et d'autres caractéristiques les fait passer à des produits plus chers l'année dernière.

D'une manière générale, l'une des principales tâches des pays est le problème de la sécurité nationale, qui est principalement la sécurité économique. Si nous regardons l'histoire de chaque pays, nous verrons que l'indifférence aux problèmes provoque des troubles sociaux qui changent les fondements de l'État. La sécurité alimentaire est un système qui fournit une satisfaction continue et durable de la demande de la population en produits alimentaires conformément aux normes de qualité établies. Par exemple, lorsque nous parlons de sécurité alimentaire, la sécurité alimentaire, l'agriculture et le secteur agricole jouent un rôle clé. En général, la plupart des produits agricoles sont produits dans les régions et 49% de la population du pays vit dans des villages et des districts, de sorte que les aspects régionaux de la sécurité alimentaire sont plus importants.

Il est connu que de nombreuses entités commerciales privées sont apparues dans le secteur agricole conformément aux réformes menées conformément aux exigences d'une économie de marché. Les agriculteurs, qui sont la principale force dans le secteur agricole, jouent un rôle important dans la formation de réserves alimentaires dans le pays, produisant différents produits dans différentes régions. Par conséquent, il est important que les agriculteurs améliorent et maintiennent leurs activités afin d'être durables dans ce domaine.

Assurer la sécurité alimentaire dans le NAR est l'un des enjeux importants. Les mesures de développement du secteur agricole du pays portent leurs fruits. Les résultats des travaux réalisés dans le secteur agricole donnent raison d'en parler. Il est important d'effectuer des travaux d'amélioration dans le domaine de l'agriculture, de prendre des mesures pour développer des produits spécifiques à l'exportation. Parce que cette région essaie de créer la sécurité alimentaire à ses propres frais. La demande alimentaire dans cette région doit être analysée d'année en année et des mesures positives doivent être prises dans ce sens.

Assurer la sécurité alimentaire reflète la situation de l'économie de telle manière qu'il est possible de satisfaire, bien que dans une certaine mesure, la demande de nourriture du point de vue d'un mode de vie sain de la population en fonction des opportunités disponibles. Il ne faut pas oublier que la sécurité alimentaire dépend du niveau de consommation alimentaire de chaque citoyen. Le travail complexe observé dans la production alimentaire, les opérations d'import-export, la polyvalence

des processus spontanés et la solution de ces problèmes nécessitent l'application de méthodes analytiques développées et une approche intégrée. Ceci est le résultat du fait que tous les concepts dans ce domaine peuvent être traités, vendus, produits, stockés, etc. Il est prévu de développer des mesures spécifiques en direction de processus multi-étapes. Par conséquent, l'un des principaux problèmes est la spécialisation et le placement dans la production agricole conformément aux conditions existantes (Abbasov, 2007: 128).

Les observations et les études montrent que pour assurer une sécurité alimentaire fiable, la production nationale de stocks alimentaires devrait être de 80 à 85%. Par conséquent, chaque pays doit soutenir son marché alimentaire en conjonction avec le marché alimentaire mondial, et s'attendre à une augmentation de la production nationale et travailler à l'amélioration de la qualité. À cet égard, le marché alimentaire du pays devrait être connecté au marché alimentaire mondial et ces relations devraient être prises en compte (T.Mamedov, 2017: p. 4). Tout d'abord, il convient de garder à l'esprit que le système de marché mondial est un marché de biens fabriqués dans de meilleures conditions ou avec des niveaux de soutien et d'exportation élevés. À cet égard, les prix sur les marchés mondiaux seront toujours inférieurs au coût des produits de mauvaise production. Nous savons que les conditions de production dans tous les secteurs de l'agriculture de notre pays ne sont pas si bonnes et satisfaisantes. Et naturellement, les conditions changent aussi toujours. Lorsque la production s'intensifie, l'instabilité augmente et le changement climatique a un effet négatif. En général, en raison du développement continu du secteur agricole dans notre pays, davantage sera dépensé pour les produits fabriqués localement. Par conséquent, ce domaine a besoin d'un soutien financier. (Atashov B.Kh., 2005: p. 125).

Dans le cadre des processus de mondialisation en cours dans le monde, il est nécessaire de satisfaire la demande croissante de produits alimentaires par la production locale. Ces problèmes ont conduit à la spécialisation des industries qui ont constitué la base matérielle de la sécurité alimentaire en République d'Azerbaïdjan et uniquement dans les régions. Diverses mesures sont prises dans le NAR pour garantir la sécurité alimentaire. En conséquence, la fourniture de nourriture à la population est financée par les ressources domestiques (<http://www.serqqapisi.az/>).

Selon l'expérience des pays développés, on peut dire que la dépendance à l'égard des importations en termes de sécurité alimentaire dans un pays peut conduire à de très mauvais résultats. Parce qu'en conséquence, la dépendance à l'égard des importations crée une aura néga-

tive sur le marché alimentaire. Les améliorations dans l'agriculture sont l'un des outils clés pour garantir la sécurité alimentaire en Azerbaïdjan d'un point de vue macroéconomique. Le NAR étant soumis à un blocus, certains travaux sont en cours pour garantir la sécurité alimentaire. Il convient de noter que le développement du secteur agricole est considéré comme l'une des priorités importantes du NAR. L'attention et les préoccupations récentes dans ce domaine ont conduit à un niveau élevé de développement agricole. Cela peut être vu dans les figures. Le climat et le fait que la population est principalement engagée dans l'agriculture ont développé leur agriculture dans ce domaine.

Pour les agriculteurs, payer 50% du coût de l'huile à moteur, du carburant et des engrais par le biais de l'État, accorder des subventions pour le travail des céréales est important pour le développement de l'agriculture et conduit à une augmentation de la productivité du travail et de l'agriculture d'année en année. Un autre point positif est qu'il peut fournir de la nourriture à ses propres frais.

NAR a pris de nombreuses mesures pour développer l'agriculture, qui joue un rôle clé dans la fourniture fiable de nourriture à la population. Pour la recherche scientifique dans le secteur agricole du ministère de l'Agriculture Ak. Association scientifique-production ARAZ du nom de G. Aliyev, ainsi que l'ouverture d'un nouveau bâtiment pour le Département de la protection des végétaux et de la production de semences, équipé d'un laboratoire et de nouveaux équipements ([Http://statistika.nmr.az/](http://statistika.nmr.az/)). En 2018, 61 935 hectares de terres ont été semés dans le NAR, et il y avait beaucoup de céréales. Par rapport à 2017, la superficieensemencée est de 505 ha de plus.

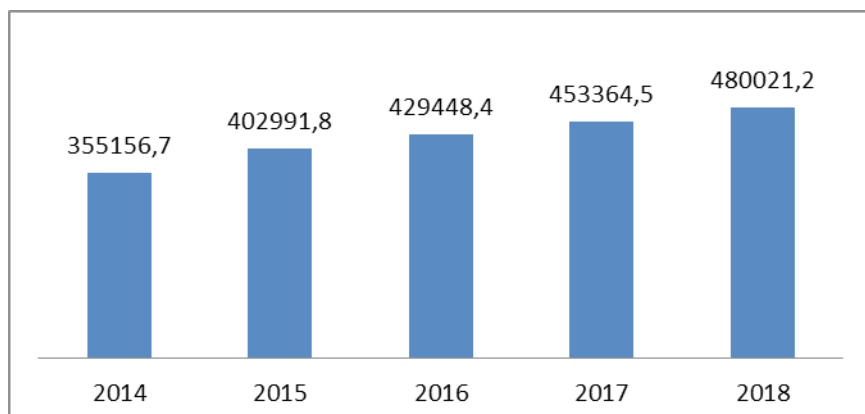
Une dynamique positive a persisté dans la production de pommes de terre en raison de la demande. En 2018, 3215 ha de pommes de terre ont été plantés. Le nombre de pommes de terre plantées pour 2017 est de 32 ha. En 2018, 49 574 tonnes de pommes de terre ont été récoltées dans 8 zones semées, soit 1,2% de plus qu'en 2017. La table est nécessaire.

L'un des domaines importants de l'agriculture est l'élevage. Pour le développement de cette zone, il a fallu prendre des mesures préventives contre les maladies du bétail et des mesures importantes ont été prises pour créer une nouvelle ferme d'élevage. En général, en 2018, 17 fermes d'élevage ont été créées, 3 ont été agrandies et 1 a été créée. Ainsi, pour 2018, 4950,4 milliers d'Azn (monnaie nationale) ont été alloués au bétail. Par rapport à 2017, cet indicateur était 2,8 fois plus élevé.

En 2018, NAR a produit 27615,3 tonnes de viande et 83967,1 tonnes de lait avec le poids principal. Par rapport à 2017, la production de vi-

ande a augmenté de 4,9% et le lait de 1,3% (http://www.statistika.nmr.az2019/2018-ci_il.pdf).

Pour 2018, les organisations agricoles ont bénéficié de prêts préférentiels d'un montant de 5 818,3 milliers de AZN. Par rapport à 2017, ce chiffre était 2,6 fois plus élevé. Les exploitations familiales jouent également un rôle clé dans le développement économique, en particulier dans le secteur agricole. En 2018, il est prévu de développer cette branche en Azerbaïdjan, et le Festival de l'économie familiale s'est également tenu. Toutes les mesures ont entraîné des changements positifs dans l'agriculture, soit 4,4% de plus qu'en 2017, c'est-à-dire que la production agricole s'est élevée à 480 21 200 manats (Graphique 1).



Graphique 1. Production agricole brute, millions d'azn

Source: préparé par l'auteur sur la base de résultats statistiques.

La création d'un approvisionnement alimentaire fiable a augmenté le potentiel d'exportation pour 2018 de 101 millions d'AR. 781 300 USD ont été exportés pour les produits agricoles, ainsi que pour les fruits et légumes.

En 2019, 62 970 ha de cultures ont été semés dans le NAR. Au cours des 9 derniers mois de cette année, environ 109 760 tonnes de céréales et légumineuses, 4 207 tonnes de maïs, 772 tonnes de tournesol, 74 934 tonnes de légumes, 49 139 tonnes de pommes de terre, 36 790 tonnes de melon, environ 40 202 tonnes de fruits, la production a augmenté de 9 869 tonnes de raisins

Ces résultats montrent que le rôle des mesures prises pour assurer l'approvisionnement alimentaire de la région sur la base des comptes internes est important.

L'approvisionnement en eau d'irrigation conformément aux normes est l'un des facteurs accélérant le développement de l'agriculture. Pour cette raison, les systèmes d'irrigation dans le NAR sont constamment mis à jour et les mesures d'amélioration des terres augmentent chaque année. Grâce au travail accompli, des travaux sont en cours pour améliorer l'approvisionnement en eau des terres et de nouvelles terres sont mises en culture. Ces dernières années, il est devenu possible d'utiliser un réseau d'irrigation fermé mis à jour sur 4135 ha dans la NAR. Actuellement, des événements ont lieu dans le village de Turkish du district de Shahbuz (P. Sayadoglu, 2019: p.59).

Afin de mettre en œuvre le programme national de développement de la production de fruits et légumes dans le NAR pour la période 2016-2020, par l'intermédiaire du ministère de l'agriculture du NAR, des mesures appropriées ont été prises pour satisfaire la demande de fruits et légumes par le biais de la production locale. Si nous regardons ces dernières années, des travaux publics sont effectués sur des terres qui ne sont pas adaptées à la culture, et les jardins plantés de cette manière enrichissent la couverture verte de l'Azerbaïdjan et offrent également d'importantes opportunités pour répondre aux besoins de la population. Ces jardins donnent une bonne récolte presque chaque année.

Le NAR réalise un travail important pour renforcer la base matérielle et technique de la culture semencière en termes de stimulation de la production de semences productives et de qualité. Pour mener à bien ces travaux, de nouveaux complexes liés à la production de semences ont été construits à Nakhichevan. Avec les céréales, l'importante base de semences de l'AR vend des semences de plantes. Actuellement, 5 complexes textiles continuent de fonctionner dans le NAR. Il est prévu de fournir aux entrepreneurs des engrais minéraux avec une remise de 70% sur la vente de graines d'orge et de blé, qui constituent des reproductions d'élite de degrés 1 et 2. En 2018, 7790 tonnes d'engrais minéraux ont été fournies aux fabricants de produits. Des subventions pour la vente des première et deuxième semences reproductives ont été accordées par l'État, ainsi qu'une aide aux agriculteurs d'un montant de 50 Azn par hectare de cultures.

Pour accroître l'intérêt du public pour l'agriculture et améliorer le bien-être matériel, 2019 est déclarée Année de l'agriculture familiale dans le NAR. Ainsi, cette année a jeté les bases de l'expansion du travail dans ces fermes.

Une analyse du Programme d'État pour l'alimentation de la population de la NAR pour 2018-2020 montre que pendant la période de développe-

ment dynamique du secteur général, les objectifs ont été atteints, de nouveaux services et productions ont été créés et des emplois efficaces ont été garantis. Grâce aux mesures prises dans ces domaines, la demande actuelle de produits dans le NAR est presque entièrement due à la production locale. Évaluant le travail accompli pour fournir à la population de la nourriture locale, le président Ilham Aliyev a déclaré: «Nous pouvons dire que les problèmes de sécurité alimentaire à Nakhchivan ont été résolus. C'est aussi un grand succès et une grande réussite. Depuis plusieurs années, des foires agricoles et plusieurs festivals de publicité organisés pour assurer la vente des produits fournis par les propriétaires terriens contribuent également à un approvisionnement fiable en nourriture de la population.

Conclusions:

L'analyse montre qu'il est nécessaire:

- augmenter la production alimentaire;
- identifier les niveaux stratégiques de sécurité alimentaire;
- identifier les mécanismes pour leur réalisation;
- identifier les priorités dans le secteur agricole;
- étudier les sources et les ressources;
- prendre des mesures importantes au niveau de l'État.

De manière générale, ces dernières années sont le résultat d'un développement agricole durable, qui joue un rôle clé dans l'alimentation de la population de la NAR. L'analyse montre que l'objectif principal d'assurer la sécurité alimentaire du NAR est de prendre les mesures appropriées, d'accroître la compétitivité sur les marchés étrangers et nationaux, de protéger les pays exportateurs contre les interférences dangereuses et de stimuler les opérations d'exportation pour organiser des événements.

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RECOGNITION AND ENFORCEMENT OF FOREIGN JUDGMENTS IN THE HONG KONG SPECIAL ADMINISTRATIVE REGION

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Hong Kong, as a special administrative region of the People's Republic of China, is interested in the effective development of the judiciary, as well as in increasing international trade. The massive increase in cross-border trade inevitably leads to an increase in the number of international litigation. International trade to a certain extent depends on mutual trust and confidence arising from the availability of effective remedies in cases of dispute.

Keywords: People's Republic of China, Hong Kong, foreign judgments, recognition and enforcement, judicial practice, reciprocity, international private law.

Introduction

Before we begin to recognize and enforce foreign judgments in the territory of the special administrative region of the PRC - Hong Kong, we note that the courts of the People's Republic of China can recognize and enforce foreign judgments in the event that a mutual legal assistance agreement is concluded between the PRC and a foreign state, China and this country is a party to an international multilateral convention or on the basis of reciprocity. At present, the Supreme People's Court of China is trying to change the criteria for applying the principle of reciprocity in order to strengthen relations with major trading partners and simplify the procedure for recognizing and enforcing decisions with countries with which there is no bilateral agreement.

To avoid any doubt, mainland China has concluded bilateral agreements with Hong Kong, Macau and Taiwan, according to which decisions made in these regions should seek recognition and enforcement in mainland China. Although the process of obtaining recognition and enforcement is similar to the process of foreign decisions, there are special and various provisions regarding jurisdiction, preservation of property, terms, etc. In particular, the applicant is allowed to apply to a higher court for review if a competent people's court refuses to recognition and

enforcement of a court decision. Therefore, the applicant is advised to carefully study these bilateral agreements before seeking recognition and enforcement in a people's court¹. A certain "independence" of these areas did not lead to the fact that foreign decisions are not recognized and are not enforced in these territories. We are more interested in the Hong Kong Special Administrative Region. Note that Hong Kong in relation to different countries has a different procedure for the recognition and enforcement of judgments.

Main part

The Hong Kong Special Administrative Region on this issue has slightly more differences than other areas of China, so its consideration becomes the most interesting. As applicable provisions on recognition and enforcement, attention should be paid to the Foreign Judgment of the Court (Mutual Enforcement), (chapter 319), (hereinafter referred to as the FJREO), the Regulation of Mainland Judgments, (chapter 597), (hereinafter the MJREO) common law system. We will analyze the application of each position separately.

The common law system is applied if the execution of the decision is not provided for in accordance with MJREO or FJREO². For example, with countries such as the USA and the United Kingdom. It is important that the procedural rules in Hong Kong do not affect the ability to consider applications for the recognition and enforcement of a foreign decision in Hong Kong³.

In order to recognize a decision under common law, it is necessary to initiate proceedings on the basis of a foreign decision by issuing a court order. Such a decision may be enforced if: a foreign court has jurisdiction over the case; the decision is final; a decision is made and the indicated fixed amount of money (not in the form of a fine or tax). Once a decision is recognized in accordance with common law, it is enforceable as Hong Kong's domestic decision. In more detail, the party begins a lawsuit in Hong Kong on the basis of a court order, which includes a statement of claim setting out the details of the debtor's debt specified in a foreign court decision. This order is given to the defendant. If the defendant does not declare his intention to protect his interests within 14 days, does not provide protection within 28 days, a simplified trial is held. After the

¹<https://practiceguides.chambers.com/practice-guides/enforcement-of-judgments-2019/china>

²[https://uk.practicallaw.thomsonreuters.com/1-618-8241?transitionType=Default&contextData=\(sc.Default\)&firstPage=true&bhcp=1](https://uk.practicallaw.thomsonreuters.com/1-618-8241?transitionType=Default&contextData=(sc.Default)&firstPage=true&bhcp=1)

³<https://weber.co.at/wp-content/uploads/2019/01/W-007-Publikationen-2017-GTDT-Enforcement-KK-1.pdf>

successful completion of any procedure for the consideration of a case under common law, it may be carried out. The method of execution depends on the type of desired performance:

1. Determining the procedure for collecting money on land and securities.
2. A court proceeding requiring a third party who owes money to the debtor by a court decision, pays the court decision of the creditor.
3. Examination of the debtor who will be interrogated as to the location of the property.
4. A court order against any movable property.
5. Liquidation, bankruptcy proceedings.

An interesting fact is that in Hong Kong it is possible to challenge a court decision, this procedure is used to protect the debtor from a Hong Kong lawsuit filed by a creditor by a court decision, the grounds are as follows⁴:

1. The foreign court did not have jurisdiction in this case.
2. The decision is not final.
3. There is no fixed amount of money in the judgment.
4. A foreign court decision is contrary to the essence of justice, contrary to public policy or a presence of fraud.
5. A foreign judgment does not comply with a recognized judgment in Hong Kong, etc.

In addition, there is a longer statute of limitations for the recognition and enforcement of foreign decisions in comparison with other areas of the PRC, namely 12 from the date of entry into force of a foreign court decision in force.

As for the recognition and enforcement of decisions in accordance with the FJREO, here a court decision means a decision made by a court in any civil proceeding or a decision made by a court in any criminal proceeding to pay a sum of money in compensation or for damages to the victim side. This decree extends to countries such as: Austria, Australia, Belgium, Bermuda, Brunei, France, Germany, India, Israel, Italy, Malaysia, the Netherlands, New Zealand, Sri Lanka.

FJREO operates a statutory registration scheme based on a mutual agreement on recognition and enforcement with the above countries. FJREO recognition is:

1. The decision must be made by a higher court, that is, a court with unlimited jurisdiction in civil and criminal matters.

⁴<https://iclg.com/practice-areas/enforcement-of-foreign-judgments-laws-and-regulations/hong-kong>

2. The decision should not be fully satisfied.
3. If the decision was partially satisfied on the date of registration, the decision shall be registered only with respect to the balance payable on that date.
4. The decision must be enforced in the country where it was originally issued.
5. The decision must be final.
6. The decision must contain a sum of money.

The limitation period is 6 years from the date of entry into force of the judgment.

At the same time, MJREO, concluded in 2008, defines the decision of mainland China as a decision, ruling, conciliation statement or payment procedure in civil or commercial matters, which is issued by a Chinese court having jurisdiction for this⁵. Recognition according to MJREO is:

1. The decision is made by a court having jurisdiction in this case.
2. The decision must be related to the commercial contract and must be made before or after the start of MJREO.
3. The parties must have a written agreement concluded before or after the start of the MJREO, determining that the courts in mainland China will have exclusive jurisdiction in the case.
4. The decision must be enforced in mainland China.
5. The decision must be final.
6. The decision must contain a certain amount of money (except for taxes and fines)

The limitation period, as in mainland China, is 2 years. 2 years from the last day indicated for the execution of the judgment, if indicated, and if not, from the date of entry into force of the decision.

There is a difference between recognition and enforcement. Recognition does not lead to automatic execution of a foreign decision; the creditor must take additional measures to enforce it. Once a decision is recognized, only then can it be enforced in accordance with law enforcement procedures. FJREO and MJREO do not contain specific provisions on registration and law enforcement procedures, but they should be understood as two separate stages concerning this issue⁶.

However, in the context of FJREO and MJREO, the recognition of a foreign decision means that it has the force of an internal court decision (handed

⁵<https://iclg.com/practice-areas/enforcement-of-foreign-judgments-laws-and-regulations/china>

⁶<https://iclg.com/practice-areas/enforcement-of-foreign-judgments-laws-and-regulations/hong-kong>

down by a Hong Kong court). Before a decision is executed, it must be registered when considering the execution procedure in the last two systems.

The registration procedure for FJREO is as follows⁷:

1. The decision of the creditor of the foreign decision is applied unilaterally by the foreign decision in the court of first instance for registration

2. If the application and other documents comply with the requirements, the court will register the decision of the foreign court.

3. The court must forward a notice of its registration to the decision of the debtor.

4. The debtor may try to cancel the registration by court order.

- registration requirements have not been met
- a foreign court did not have jurisdiction in this case
- decision the debtor did not receive a notice of foreign proceedings;
- the decision was obtained by fraud;
- enforcement of a foreign decision is contrary to public policy in Hong Kong;
- rights by a court decision do not belong to the person to whom the application for registration was filed.

5. If the registration is not canceled within the specified time, the creditor may begin to execute the registered decision of a foreign court by a court decision.

The registration procedure for MJREO is as follows⁸:

1. A creditor having a decision in mainland China must file an application with the court of first instance to register the decision. The application must have other documents:

- a certified copy of a decision made in mainland China;
- a duly certified copy of the court selection agreement in mainland China.
- certificate from the mainland court that the decision is final between the parties;

2. If the application and other documents are in order, the court will register the decision of the foreign court.

3. The court must give a notice of registration to the decision of the debtor;

4. The debtor, by a court decision, may try to unregister:

- the requirements for registration were not met or the decision was registered in violation of MJREO;

⁷<https://iclg.com/practice-areas/enforcement-of-foreign-judgments-laws-and-regulations/hong-kong>

⁸<https://iclg.com/practice-areas/enforcement-of-foreign-judgments-laws-and-regulations/hong-kong>

- the choice of court in the territory of Mainland China in the agreement was invalid or, if it was not recognized as valid by the material court;
- the decision was fully satisfied;
- courts in Hong Kong have exclusive jurisdiction;
- the debtor, by a court order, was not called properly or was not given sufficient time to defend himself in accordance with the laws of mainland China.
- the decision was obtained by fraud;
- execution of the decision is contrary to public policy;
- the decision has been made on the same subject, or has already been recognized or enforced outside Hong Kong.
- the decision was quashed in mainland China.

5. If the registration is not canceled within the specified time, the creditor of the court decision may proceed with the execution of the registered foreign court decision. If the creditor of the decision seeks to issue a performance in accordance with FJREO or MJREO, a written confirmation of the registered decision and any other order made by a Hong Kong court must be presented to the Registrar. The decision may be executed by any of the means available to enforce the Hong Kong decision (see above).

A party seeking to enforce a foreign decision in accordance with FJREO or MJREO must apply to the Court of First Instance (hereinafter-CFI) to register a foreign decision. Similarly, a party seeking to enforce a foreign decision in Hong Kong in accordance with common law should also initiate proceedings at CFI⁹.

In addition, if the creditor, by a court decision, wants to execute a decision on a party other than the named debtor by decision, then the creditor by decision will need to start a new trial against that party and refer to circumstances in which the creditor, by decision, claims that the third party is e.g. agent¹⁰.

If the parties had an effective agreement on the use of alternative dispute resolution, and the defendant claims that the striving party did not fulfill this requirement, then this will be the basis for canceling the CFI registration of the court decision¹¹.

An interesting fact is that it became possible to enforce non-monetary decisions under Hong Kong common law in the Jiang Xi An Fa Da Wine Co. Ltd. vs Zhan King in 2019. The trial court noted that such an innova-

⁹<https://weber.co.at/wp-content/uploads/2019/01/W-007-Publikationen-2017-GTDT-Enforcement-KK-1.pdf>

¹⁰<https://weber.co.at/wp-content/uploads/2019/01/W-007-Publikationen-2017-GTDT-Enforcement-KK-1.pdf>

¹¹<https://weber.co.at/wp-content/uploads/2019/01/W-007-Publikationen-2017-GTDT-Enforcement-KK-1.pdf>

tion would help open doors for new opportunities when executing non-monetary cases in the common law regime¹².

An agreement was also concluded on the mutual recognition and enforcement of court decisions on civil and commercial cases by the courts of mainland China and the Hong Kong administrative region (January 18, 2019). The agreement covers the consideration of both monetary and non-monetary cases and other issues.

In addition to China, Hong Kong has not entered into any international treaties on the mutual recognition of the enforcement of foreign judgments. In general, since China regained sovereignty over Hong Kong on July 1, 1997, Hong Kong's approach to concluding these treaties will be governed by China's decision to extend the territorial application of such treaties to Hong Kong (for example, China has extended the territorial application of the Convention on the Recognition and Enforcement of Foreign Arbitral Awards, New York Convention, Hong Kong July 1, 1997)¹³.

Conclusion

China's recent announcement of "Belt and Road" political initiatives and the creation of the Asian Infrastructure Investment Bank are clear evidence of China and Hong Kong's desire to join the mainstream of the global economy. There is no doubt that the Chinese government will increasingly strive to improve the functions of its judicial system. The implementation of judicial reforms will be positively received due to the integration of China into the world economy by attracting an increasing number of foreign investors. New ideas on the effectiveness of recognition of foreign court decisions in China will increase the competence of Chinese courts in international civil and commercial litigation.

In any case, the Hague Conference on Private International Law, held in 2019, helped to resolve some issues in this topic. Everyone is looking forward to China ratifying the full text of the convention, which will allow to resolve contentious issues and establish mutual relations more effectively in China, and will expand the possibility of considering other categories of cases in Hong Kong.

At this stage, the provisions of this Convention apply only to the extent that the PRC has "signed" the Hague Convention on the Recognition and Enforcement of Foreign Judicial Decisions in Civil and Commercial Cases, therefore, the court will not require strict observance of its provisions for the recognition of a foreign decision, until its full signature and ratification¹⁴.

¹²<https://iclg.com/practice-areas/enforcement-of-foreign-judgments-laws-and-regulations/hong-kong>

¹³<https://weber.co.at/wp-content/uploads/2019/01/W-007-Publikationen-2017-GTDT-Enforcement-KK-1.pdf>

¹⁴<https://weber.co.at/wp-content/uploads/2019/01/W-007-Publikationen-2017-GTDT-Enforcement-KK-1.pdf>

The Convention on the Recognition and Enforcement of Judicial Decisions is aimed at establishing uniform legal rules with regard to the recognition and enforcement of judicial decisions, which will ensure international participants in judicial proceedings confidence in cross-border transactions¹⁵.

There is no doubt that China, like Hong Kong, has become an important economic player in the global context. In particular, the exchange of capital, the flow of which was traditionally only incoming - the attraction of foreign investment in China - has now become multidirectional, as Chinese investment is attracted abroad to other countries. Thus, with regard to the progressive development of international trade, in the near future the number of cross-border disputes regarding Chinese enterprises or businessmen will increase. Consequently, Chinese judgments seeking recognition in foreign jurisdictions will appear more often. Consequently, facilitating the reliable free presentation of court decisions for recognition and enforcement will benefit not only China, but also other countries and trade partners of China. Therefore, it is so important that the recognition and enforcement of decisions in Hong Kong is fully consistent with the chosen direction as a whole.

For the most part, the conditions for recognition / non-recognition and enforcement / non-compliance do not differ, which is an unconditional positive moment, despite the "independence" of this region and the existence of laws, some of which are different from the laws of mainland China. Speaking about the problems that a party may encounter when applying for registration, these are most often procedural issues, as in mainland China.

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2. <https://weber.co.at/wp-content/uploads/2019/01/W-007-Publikationen-2017-GTDT-Enforcement-KK-1.pdf>
3. <https://iclg.com/practice-areas/enforcement-of-foreign-judgments-laws-and-regulations/china>
4. <https://iclg.com/practice-areas/enforcement-of-foreign-judgments-laws-and-regulations/hong-kong>

¹⁵<https://iclg.com/practice-areas/enforcement-of-foreign-judgments-laws-and-regulations/hong-kong>

LEGAL RESPONSIBILITY AS A LEGAL FORM OF THE STATE'S RESPONSE TO WRONGFUL CONDUCT¹

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The article is devoted to the analysis of the relationship between the concepts of the state's reaction to unlawful behavior and legal liability, which, according to the author, are unreasonably identified. The general concept of this reaction and the requirements which it must meet are considered: inevitability, negative character and proportionality to the deed. The idea is substantiated that legal liability can only be retrospective and represents a legal relationship arising in connection with the commission of an offense. It is argued that the concept of legal responsibility as one of the legal forms of the state's reaction to unlawful behavior is not an alternative that adequately reflects the meaning and content of the state's reaction to the act of committing an offense, equivalent or identical to this category. At the same time, a need is identified for such a unifying category, which would cover all existing and, in principle, other forms of state reactions to unlawful behavior and would provide an integrated approach to using the entire arsenal of means available to the law in order to more effectively and reliably ensure the rule of law.

Keywords: social responsibility, legal responsibility, reaction

1. In the process of numerous scientific studies, it was found that the state responsible for ensuring security and the proper rule of law in society and building for this purpose a system of legal norms and relations is obliged (cannot but) to respond to their violation, this is necessary to ensure the implementation of legal norms and prevention their massive violations later on. Each act of an offense must inevitably entail the appropriate reaction of the state - its response to the violation of the legal prohibition established by it.

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What should be this reaction? The most important, key value for penetrating into the essence, content, goals and mechanism of the state's reaction to socially dangerous behavior, and ensuring its effectiveness in practice, according to the author, are three basic requirements: each act of behavior dangerous to society should inevitably entail a corresponding reaction of the state - its obligatory, *inevitable response* to the fact of dangerous behavior for society, especially if it is associated with a violation of the precept (ban) established by it. This reaction, by its nature and content, should be *negative, condemning* of a malicious act and condemning the perpetrator for what was done, accompanied, if necessary, by deprivations and restrictions prescribed by law; however negative in moderation, i.e. *proportionate to the deed*, corresponding to the prevailing notions of justice in society [1, p. 101].

2. In domestic legal theory and in legal practice, the reaction of the state in response to socially dangerous behavior associated with the violation of established legal prohibitions usually comes down to the concept of "legal liability" and its "subsidiary" industry concepts of "administrative responsibility", "civil liability", "Criminal liability", etc. [2; 3; 4; 5; 6; 7; 8, p. 57-86; 9, p. 106-111; 10; 11]. It is presumed that these concepts most accurately and fully reflect the essence of the state's response - its reaction to the act of committing an offense. However, upon closer examination, it turns out that the assignment of responsibility is only one of the forms of the state's reaction to the offense, the question of the correlation of these phenomena and concepts about them and, in particular, the hypothesis of their coincidence or identity needs further reflection on the basis of a deeper and a careful analysis of the content and significance of these phenomena themselves and concepts about them.

3. According to our ideas, legal responsibility is one of the types of a more general concept of social (general social) responsibility - the initial category on which all the doctrine of responsibility is based.

Recognizing that the category of social responsibility can have both negative (retrospective) and positive forms of expression, we defend the point of view that further differentiation concerns only its negative (retrospective) form. Depending on the type of violated legal norms, the latter is naturally and necessarily divided into types and subspecies: moral, religious, corporate, legal (administrative, criminal, disciplinary, civil), etc. Positive social responsibility in the same or other way it cannot be differentiated - there is no such or other necessary basis for this. Representing a scientific (evaluative, "sensual") abstraction from the field of morality, ethics, psychology, pedagogy, sociology, philosophy, and in the field of

law, a positive form of social responsibility has the same meaning and significance, meaning the same thing: it is a requirement of a positive, socially useful, “responsible” personality behavior. For this reason, this concept does not need to be materialized and divided into species; there is neither sufficient reason nor meaning for this.

The division of social responsibility into types and, in particular, the allocation of legal responsibility and its types, has the necessary grounds, goals and meaning only in retrospect. We do not share the point of view on the differentiation of legal responsibility and its types (in particular, criminal liability) into negative (retrospective) and the so-called positive [10, p. 14; 11, p. 51, 191; 4, p. 74-75, 121-122]. Legal responsibility and its “affiliated” types can only be retrospective - these are concepts about the negative legal consequences of violation of certain legal norms that materialize, acquire specific forms and outlines only in relation to the norms of specific branches of law - in cases where they are violated. In the branches of law there is a concretization of these concepts and their adaptation to the corresponding reality. Informed and correct, it seems to us, in particular, is the opinion of O.E. Kutafin, who believes that the concept of “positive responsibility” is not legal and, therefore, constitutional [12, p. 400], so it would be right to abandon this concept as a legal one. Other researchers adhere to a similar opinion, who believe that “of course, the semantics of the word “responsibility” allows us to talk about the possibility of its use in both positive and negative meanings. However, the first aspect of the concept is hardly applicable in the legal sphere as insufficiently substantiated and not quite appropriate” [13, p. 23], and “the lack of clear criteria and indicators of positive legal responsibility, the uncertainty of its legal significance, can disorient law enforcement, since the practical role of this institution is difficult to establish...” [13, p. 24].

4. Legal responsibility, therefore, is a type of social retrospective responsibility, and it is in this capacity that it relates to the problem of the state’s response to illegal behavior, being one of the legal forms of its implementation. This is one of the fundamental legal concepts and the most important legal institution, which is of fundamental importance in determining the grounds and limits of law enforcement activities of the state.

At the same time, the concepts, the authors of which proceed from unilateral representations of legal liability as soon as the *state’s right* to “apply coercive measures” or as soon as the *guilty’s obligations* to “undergo the specified effect”, seem to us to be one-sided, therefore they cannot be considered sufficiently accurate and correct.

A semantic analysis of the concept of “responsibility” and its root, word-forming basis of the term “response” shows that both of these concepts, on the one hand, mean a response (“answer”, “reaction”, “give an answer”, react) someone to something, but on the other hand, the perception of this reaction, in the sense of “to be held responsible” or “answering for” the deed, for one’s deed [14, p. 624: 15, p. 401]. Moreover, both of these values are necessary and equivalent, none of them can be recognized as prevailing or less significant. Accordingly, the concept of responsibility based on the root “response” also means: on the one hand, the responsibility of the subject of the offense to answer, “give an answer”, “to be held responsible” for the deed (undergo negative consequences for breaking the law); on the other hand, the right of the state to “give an answer” to an act of unlawful behavior, to respond to an unlawful behavior of a subject, or to “demand, demand an answer, report” from a subject for what he has done, cannot be considered unilaterally – only in one of the indicated meanings.

The concept of legal liability from the substantive point of view has at least two meanings, two sides:

a) responsibility as a response, an “answer” of the state to a violation of its prohibition; the state, by virtue of its obligations to society, has the right to judge the perpetrator for an offense, and it is obliged to do this by virtue of its obligations to society (the “active” aspect of the content of legal liability);

b) responsibility as the perception of the indicated reaction of the state on the part of the person who has violated the criminal law prohibition, which implies the obligation of the person who committed the offense, to respond to the specified requirement of the state, “answer” for the deed and undergo unfavorable consequences defined by the criminal law (“passive” aspect of the content of legal liability²).

Legal liability takes place, it is realized when both parties marked by it are present, exercising their mutually corresponding rights and obligations. It involves both an inevitable negative assessment (conviction, censure) of the committed unlawful act and the identity of the offender – the demand from the perpetrator, the application of legal measures prescribed by law, and the perception of such a well-deserved assessment by the guilty, his duty to “answer for what he did”, to undergo his punishment in accordance with the law. Therefore, reducing the concept of criminal liability to only one of these aspects that make up its content is incorrect.

²This form of liability is called passive, because the responsibility for its implementation does not lie with the very subject of the offense: the person who committed the offense is subject to prosecution by the state in the person of state bodies authorized by it.

These two sides of the actual social relations arising from the commission of an offense are closely interrelated. Their ratio is characterized by the dialectical law of unity and struggle of opposites, and serves as a factor in resolving the situation generated by the commission of the offense. Settled by the rules of law, such a public relation takes on the form of a legal relationship arising in connection with the commission of an offense, the content of which is mutually corresponding to the rights and obligations of the parties - the state that established the corresponding ban and the perpetrator who violated this ban.

5. By its nature, legal responsibility as a socio-legal phenomenon is a form (one of the forms) of the mediated right of the state reaction (response) to an act of offending behavior. It is in connection with the need to materialize this reaction - the need to officially condemn the offense and censure the person guilty of its commission, this concept is valuable and put into legal circulation.

At the same time, both of these concepts - legal responsibility and the state's reaction to criminal behavior cannot be considered equal or, especially, identical. An analysis of these concepts confirms our hypothesis that these concepts are close, but not identical. These concepts have a common foundation, legal nature, essence, purpose, and goals, however, at the same time, they differ significantly and are located, as it were, on different planes.

If the state's reaction to the commission of an offense is a social phenomenon caused by the objective need to respond to behavior dangerous to society, it has an objective (more precisely, objective-subjective) nature as the natural response of society in the person of the state to external irritation that causes or creates a threat of harm to interests individual, society or state, then legal responsibility is only one of the forms of manifestation of such a reaction, its external expression, indirect relationship regulated by law between its subjects.

If the state's reaction can be either legal or non-legal, then legal responsibility is a purely legal phenomenon, subjective, with all the consequences arising from this. This is a subjective category designed to show how the fact of the offense is reflected (or how it should be reflected) on the existence and legal status of the guilty person and how the latter should perceive it.

Since the state's reaction to criminal behavior is the responsibility of the state, it is characterized by imperativeness, while legal responsibility, which is a legal relationship between the state and the subject of the offense, is characterized by dispositiveness.

Finally, the state's reaction to the offense is a broader, more voluminous phenomenon than legal liability. Firstly, the state reacts to the act of the violation already from the moment of its commission, when only the basis for the legal responsibility of the guilty party arises, but not the responsibility itself, which is realized only from the moment the relevant enforcement act (for example, a court's conviction in a criminal case) comes into force. Secondly, domestic legislation (in particular, administrative, tax, and criminal) provides for the possibility of responding to an offense with the release of the subject of the offense from liability (e.g., Art. 2.3., 2.5., 2.9, 15.11 of the Administrative Code of the Russian Federation; Chapter 11 The Criminal Code), that is, the state's response to the offense can be implemented, including in forms not related to bringing the perpetrator to legal responsibility: within the framework of institutes of exemption from liability and (or) exemption from punishment.

6. Thus, legal liability is only one form of the state's reaction to unlawful behavior, therefore, the concept of it is not an alternative that adequately reflects the meaning and content of this reaction, which is equivalent or identical to this category. Meanwhile, a category that would cover all existing and possibly other forms of the state's reaction to unlawful behavior would serve to ensure an integrated approach to using the entire arsenal of means at the disposal of the law, overcoming their limitations, disunity and lack of system for more effective and reliable maintenance of law and order, while all forms of implementation of which would meet the essential requirements discussed above are necessary. And this problem requires further scientific reflection.

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LES PRINCIPALES DIRECTIONS DU DÉVELOPPEMENT DE PROCESSUS INNOVANTS ET L'APPLICATION DE NOUVELLES TECHNOLOGIES DANS LE PROCESSUS ÉDUCATIF DE L'ÉCOLE PRIMAIRE

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L'article examine les principales directions de développement de processus innovants. Les travaux de recherche révèlent comment appliquer les nouvelles technologies dans le processus éducatif des classes primaires. Les aspects pédagogiques modernes de la formation de la personnalité sont analysés. L'article identifie les technologies éducatives, les compétences professionnelles des enseignants, explore les moyens de se conformer aux normes professionnelles et morales au cours de sa carrière professionnelle. L'article discute des traits de personnalité individuels dans l'éducation, des méthodes sont proposées pour améliorer la compréhension mutuelle dans le processus éducatif entre les participants au processus éducatif.

Mots clés: innovation, innovations, technologies pédagogiques, processus éducatif, enseignant du primaire, activité innovante.

Les technologies pédagogiques jouent un rôle important dans l'amélioration de l'efficacité du processus éducatif dans les classes élémentaires. La technologie pédagogique est une nouvelle approche du processus d'apprentissage. Grâce à l'application de nouvelles technologies pédagogiques dans le processus éducatif, il est possible d'améliorer sa qualité. Dans ce cas, le processus d'apprentissage devient le processus le plus gérable. Les technologies d'apprentissage activent également les activités des participants au processus éducatif. Le concept de «technologie d'apprentissage» a été introduit en 1950. Il a été inclus dans le processus éducatif en tant que système étendu qui couvre l'objectif, le contenu, le principe, la méthode, la forme organisationnelle, le contrôle du résultat. L'idée principale était de donner vie à la technologie éducative à l'écran. Le terme technologie, qui vient de deux expressions grecques comme "techne" et "logos". «Techne» signifie «compétence», «capacité»,

«connaissance», «expérience», «habitude» et «logos» est traduit par «formation». Ainsi, le terme technologie est utilisé pour désigner l'acquisition de connaissances et de compétences.

V.P. Bepalko a défini la technologie comme l'expression systématique et cohérente dans la pratique d'un système coordonné interconnecté ou d'un processus pédagogique préconçu visant à résoudre les problèmes pédagogiques de l'activité d'un enseignant [3]. Le terme «technologie pédagogique» est largement utilisé. Cela s'applique au système à l'étude, puis à la direction technologiquement développée et déjà mentionnée dans la didactique du système de méthodes et de techniques de tout enseignant, et, enfin, à la méthodologie d'enseignement et aux méthodes individuelles. Il existe différents types de technologies pédagogiques. La classification proposée par G. N. Selevko est répandue. Les vues de G. N. Alexandrov sur la technologie sont très intéressantes. «Les technologies pédagogiques sont une forme commune d'activité, de méthodes et de techniques communes qui assurent l'efficacité du développement du système pédagogique de l'enseignant et de l'élève et la réalisation des objectifs pédagogiques fixés» [1, 133].

Sh.A. Amonashvili a scientifiquement prouvé et vérifié le contenu, les principes et les conditions de travail avec les enfants de six ans dans la pratique. Sa technologie peut être définie comme une personne humaniste, qui comprend les domaines suivants:

- En révélant les qualités personnelles de l'enfant, crée les conditions pour la formation, le développement et l'éducation d'une personne noble en lui;

- La noblesse (guérison) du cœur et de l'âme de l'enfant.

- Développement et formation des capacités cognitives chez un enfant;

- Fournir les conditions d'une connaissance approfondie et approfondie des compétences;

- L'idéal de l'auto-éducation.

Sh.A. Amonashvili exprime l'idée de pédagogie de la coopération comme suit: [2, p. 48].

À Bakou, où il a passé plusieurs décennies de sa vie, son professeur a créé un système efficace de gestion de l'apprentissage des élèves. Sa «gestion interprétée, la mise en œuvre de l'idée de formation avancée et l'utilisation d'un schéma de référence permettent à chaque enfant de ressentir la joie du succès, de se former à la lecture, de mener des activités éducatives et cognitives gratuites».

Les processus innovants dans le domaine de l'éducation deviennent

un sujet d'apprentissage, sont d'une grande importance pour prévoir et concevoir les futures réalités pédagogiques, améliorer les technologies pédagogiques, une nouvelle compréhension des nouvelles méthodes, outils et techniques. Lors de l'introduction d'innovations, il est nécessaire de prendre en compte les capacités internes du système éducatif.

L'état conceptuel de la technologie moderne comprend les positions suivantes:

- approche personnelle, pédagogie de la coopération;
- succès dans le développement des enfants dans l'éducation;
- avertissement d'erreur;
- cohérence, systématique (régularité) du contenu du matériel pédagogique;
- acquisition de connaissances pour tous;
- l'évaluation, d'un étudiant qui sait à un étudiant qui ne sait pas;
- indépendance progressive totale.

Les principales idées conceptuelles de l'école élémentaire du XXI^e siècle:

1. Compléter le développement harmonieux de l'étudiant, la formation de compétences communes, l'érudition inhérente aux capacités individuelles de chaque personne;
2. Le développement de l'activité culturelle élémentaire, l'acquisition de connaissances perceptuelles sur le problème de l'éducation, la définition des opérations éducatives par le contrôle, la maîtrise de soi, l'évaluation et l'estime de soi.
3. La formation d'une formation autodidacte, qui détermine le niveau des intérêts cognitifs et de la culture.

Les auteurs expliquent le développement des classes primaires comme suit:

- le développement est une capacité établie à utiliser ses connaissances dans des situations inhabituelles;
- le développement est une capacité bien développée d'acquérir des connaissances, de déterminer la capacité générale de structurer des tâches éducatives, l'initiative de l'élève d'hypothétiser, dans la recherche de preuves, le désir d'effectuer une tâche de façon créative;
- la capacité de comprendre sa propre ignorance, de trouver la cause des erreurs, de comparer les résultats de ses activités avec la norme, la capacité d'évaluer indépendamment les processus et les résultats des problèmes éducatifs;
- il s'agit d'un niveau élevé de processus mentaux (adaptés à l'âge): imagination, réflexion, parole connectée, etc.

Pour atteindre un tel niveau de développement des classes primaires, les auteurs proposent de mettre en œuvre les idées suivantes à la suite d'un réel apprentissage:

- développer la formation en tenant compte des caractéristiques psychologiques et des capacités des élèves;
- la méthodologie d'étude de chaque matière est centrée sur le développement global de l'enfant;
- la formation d'activités éducatives en augmentant la culture spirituelle et émotionnelle de l'enfant.
- la formation est basée sur l'évaluation, ce qui vous permet de prendre en compte le rythme de progression individuelle, corriger les difficultés, apporter un soutien à vos compétences, l'étudiant doit apprendre à résoudre tout problème de manière autonome, mais à des moments différents.

L'expérience de l'école élémentaire au cours de la dernière décennie montre qu'il s'agit d'une approche plus efficace et plus productive de l'éducation axée sur la personnalité.

Les tentatives pour réaliser l'idée d'apprendre sont initiées dans la pratique mondiale, sur la base des idées de J. Dewey, J.J. Russo, I.G. Pestalossi, M. Montessori, K. D. Ushinsky. Tous les enseignants avaient des concepts différents, mais tous étaient unis par le désir de développer une personnalité libre, pour donner à l'étudiant l'opportunité d'une activité cognitive active. Une approche intéressante est V.A. Petrovsky pour construire une didactique axée sur la personnalité. I.S. Yakimanskaya dans ses travaux note que V.A. Petrovsky a trois principes stratégiques:

- La variabilité des modèles d'apprentissage;
2. synthèse de l'intelligence, des émotions et des actions;
3. chaque enfant a la possibilité de présélectionner les activités qui lui sont plus précieuses.

EST. Yakimanskaya a développé le projet "École à orientation personnelle". Le cadre conceptuel de ce projet est le suivant:

- formation et éducation, guidant et adaptant le développement de la personnalité et de l'individualité;
- développement de la technologie du processus éducatif (cognition, socialisation, auto-éducation, auto-réalisation) basée sur l'utilisation de la culture pédagogique identifiée et l'expérience subjective de l'élève;
- développement d'une base de critères scientifiquement fondée permettant de programmer des technologies pédagogiques axées sur la personnalité.

Nous partageons l'opinion d'I.S. Yakiminskaya qu'il devrait satisfaire

les besoins de toutes les matières et les participants du processus éducatif: les enfants, leurs familles, la formation de tout le personnel enseignant [9].

La réussite d'un enseignant à l'école primaire dépend de la connaissance de la méthodologie d'utilisation de l'innovation. La connaissance de la méthodologie d'utilisation de l'innovation permet une application plus efficace des informations théoriques innovantes. Comme vous le savez, les approches reflétées dans la littérature étrangère se reflètent également en Azerbaïdjan. Les étapes de l'innovation couvrent la voie vers leur résultat effectif. Ces étapes sont les suivantes:

1. Développement. Cela signifie matériel et manifestation d'une nouvelle idée.
2. Conception. À ce stade, la technologie est décrite en langage technique.
3. Création, construction de nouvelles informations ou technologies;
4. Test et assimilation de nouvelles informations;
5. Production pratique, de masse et durable.

Comme vous pouvez le voir, l'innovation se reflète principalement dans les processus de production et économiques. Les innovations dans tous les domaines de la vie servent essentiellement le même objectif, mais les innovations correspondantes sont utilisées conformément au contenu et à la forme de chaque secteur de l'économie. Il est important d'en tenir compte dans le processus de formation.

L'objectif principal de cet article est d'identifier les approches du problème de l'innovation pédagogique, l'utilisation de méthodes d'apprentissage actif et la pratique scolaire pour assurer l'innovation. Les enseignants du primaire ont une idée précise de la nature et du contenu des innovations pédagogiques. Ces informations proviennent principalement de la littérature étrangère et d'Internet. À mesure que la société évolue dans le domaine pédagogique, de nouvelles exigences sont présentées, comme dans tout autre domaine. Il est donc nécessaire d'améliorer le processus pédagogique, l'application de nouveaux contenus, formulaires et méthodes. L'amélioration du système pédagogique dans les écoles secondaires se fait de deux manières: a) de manière intensive; b) le vaste chemin. Un moyen intensif consiste à mobiliser les ressources internes du système pédagogique. Une approche extensive consiste à attirer des forces, du temps et des ressources supplémentaires dans le processus pédagogique. Par exemple, vous pouvez prolonger la période de formation et étendre les programmes pour donner à la jeune génération des connaissances plus approfondies. Cependant, cet objectif peut être atteint sans lui. Par ex-

emple, en appliquant de nouvelles méthodes, en améliorant la forme et le contenu existants, en inculquant aux étudiants les compétences d'un travail indépendant, vous pouvez les attirer vers l'auto-éducation. C'est une manière intensive.

L'échelle de l'innovation dans le processus pédagogique peut être différente: améliorer une certaine méthode, former, appliquer de nouvelles technologies de travail, mettre à jour le système éducatif, etc.

À l'heure actuelle, des réformes sont en cours dans notre pays dans le domaine de l'éducation, de grands changements sont en cours dans la base matérielle de l'éducation, dans le contenu et la méthodologie de l'éducation et de l'éducation, dans les relations enseignant-élève, dans la gestion.

Les principaux domaines d'innovation du système pédagogique sont:

- démocratisation de l'école;
- humanisation du processus pédagogique;
- application d'une pédagogie commune;
- élargissement du contenu de l'éducation et de l'éducation;
- optimisation du processus éducatif;
- application de nouvelles technologies pédagogiques;
- améliorer le système de gestion scolaire;
- reconstruction du système de formation continue;
- organisation de l'enseignement conformément aux normes internationales, etc.

L'éducation et l'enseignement est un processus dialectique historique qui existe depuis des milliers d'années et consiste à acquérir et à maîtriser des connaissances, des compétences et des capacités. L'éducation a toujours été dispensée dans le cadre du processus pédagogique à tous les niveaux et à tous les stades du système éducatif et, par conséquent, un développement a été réalisé qui garantit une position humaine active. Diverses vues et idées théoriques ont été avancées, des travaux pédagogiques pratiques, des objectifs, des tâches, de l'essence, du contenu, des principes, des méthodes d'enseignement, des formulaires, des méthodes d'enseignement, etc. ont été généralisés et distribués.

Facteurs importants, tels que le développement de la société, les besoins socio-sociaux, spirituels et culturels, le progrès scientifique et technologique, les formes mises à jour des relations économiques, la stratégie de développement de l'État, obligés de mettre à jour le but et les objectifs de l'éducation, le contenu de la formation, les méthodes et les technologies, les innovations sont devenues un travail actif sur construire une nouvelle société. Ce processus a particulièrement retenu l'attention

avec les changements intervenus depuis le début du nouveau siècle. Les créateurs de la nouvelle théorie de l'enseignement et de la pratique de la nouvelle ère ont tout d'abord soigneusement étudié l'expérience du développement historique, en ont profité, ont développé quelque chose sous une nouvelle forme, ont correctement compris l'essence de ce processus et déterminé la méthodologie d'enseignement. Nasruddin Tusi (XII siècle) dans les œuvres Moral-Nasiri, Y. A. Komensky (XVIII siècle), Great Didactics, Yu.Yu Russo (XVIII siècle), K .D.Ushinsky (XIX siècle), L.N. Tolstoï (XIX siècle) et d'autres ont résumé le chemin de développement qui a eu lieu avant eux et la réalisation de ce chemin. Ils ont formé leurs propres concepts - les théories de l'éducation, qui ont créé une nouvelle étape.

Le 21e siècle, étant l'apogée du développement de tous les siècles précédents, a actualisé davantage le niveau intellectuel d'une personne en tant que personne. Il a élevé l'état d'esprit, des sentiments humains plus actifs, l'instauration de la justice et de la démocratie, la société civile au niveau du principal objectif de l'éducation. Parce que le progrès scientifique et technologique a atteint un niveau de développement très élevé et des réalisations sans précédent, ainsi que des conséquences catastrophiques. Et pour éviter les catastrophes, il est nécessaire d'activer l'esprit humain et le sens de l'humanité, d'augmenter la conscience de soi et l'estime de soi, d'évaluer l'activité, l'attitude, de renforcer la mission civile, etc. Avec de nouvelles méthodes d'enseignement et de nouvelles formes de travail, le développement de la pensée critique, de la pensée indépendante et du travail pratique, qui jouent un rôle important dans les résultats mentaux, est devenu une priorité.

À l'heure actuelle, comme dans d'autres pays développés, l'utilisation des innovations en Azerbaïdjan est largement débattue et écrite. Cependant, il est évident que ces travaux innovants imitent ou véhiculent l'expérience des pays occidentaux. Ni la base sociologique-philosophique ni la base pédagogique-psychologique des innovations - nouvelles méthodes et technologies d'enseignement - ne sont des idées importantes sur les points de vue théoriques, les idées et les opinions, en d'autres termes, sur la méthodologie. Autrement dit, le but et les principes de la formation ne sont pas divulgués. Dans le meilleur des cas, il résume simplement les concepts nouveaux dans la terminologie pédagogique et énumère les informations de la nouvelle littérature sur les nouvelles méthodes. Ils ne sont souvent pas perçus par tous au même niveau et ne sont même pas acceptés par beaucoup. Parce que ces informations véhiculent l'esprit de la société occidentale, les occidentaux. Par conséquent, une expérience de travail occidentale intéressante et utile

devrait être combinée avec une expérience nationale et moderne et appliquée conformément au contexte national afin qu'elle puisse être nationalisée et popularisée. Par conséquent, en Azerbaïdjan, il est nécessaire de connaître et d'étudier l'histoire de l'éducation, en particulier les méthodes et technologies d'enseignement. Pour cela, nous considérons qu'il est approprié de clarifier certaines des questions de l'histoire de notre éducation qui sont pertinentes aujourd'hui. Parce qu'il est impossible de déterminer et de résoudre plus précisément les problèmes de tout développement sans tenir compte de l'histoire, du patrimoine et de la modernité. Des innovations ont été appliquées au Moyen Âge, principalement dans l'amélioration des technologies d'apprentissage. Les méthodes d'enseignement, l'organisation du processus éducatif, la finalité et l'essence de l'éducation ont subi un processus de renouvellement en fonction du niveau de développement de la société.

L'une des tâches principales de l'éducation moderne est la réalisation d'une pensée élevée et indépendante, le respect de l'unité des mots et des actes, l'utilisation de diverses méthodes et technologies éducatives à cette fin. Ainsi, nous devons affiner la nomination de nouvelles méthodes que nous utilisons pour former une culture de pensée logique, critique et créative, la communication avec la jeune génération, les préparer à des activités pratiques basées sur notre héritage pédagogique classique, et, ainsi, créer des conditions pour personne idéale, véritable citoyen.

Bien sûr, aux XIX-XX siècles. la pratique de l'éducation et de la formation s'est construite en fonction d'un nouveau niveau de développement de la société, des réalisations scientifiques et technologiques, de nouvelles théories et pratiques sont apparues à travers le monde, notamment en Occident. Conformément aux exigences de la mondialisation au XXI^e siècle, les meilleures pratiques de tout pays sont étudiées, acceptées et appliquées par d'autres pays du monde. Cette tendance existe également en Azerbaïdjan. La prise en compte des principes d'application des innovations pédagogiques permet d'aligner le processus pédagogique sur les exigences de la nouvelle ère.

À mon avis, la considération de plusieurs principes d'application des innovations pédagogiques, que j'ai mentionnés dans les hypothèses ci-dessus, peut être utilisée plus largement:

- Le principe de trouver un modèle pour appliquer l'innovation et son utilisation efficace;
- Le principe de la sensibilisation des enseignants à l'innovation;
- utilisation ciblée de l'innovation dans le processus pédagogique;
- la direction de l'utilisation de l'innovation dans le processus éducatif

à des fins éducatives;

- la direction de l'utilisation de l'innovation dans le processus éducatif dans le sens de l'approfondissement des connaissances;
- Le principe de l'impact de l'utilisation des innovations sur le développement de nouveaux modèles d'apprentissage;
- Le principe d'identification précise des approches innovantes dans l'utilisation des méthodes et technologies d'enseignement.

Les modèles, les contradictions, les nuances qui surviennent dans le processus pédagogique et l'utilisation de l'innovation pour les résoudre peuvent grandement aider l'enseignant à résoudre le problème. Les chercheurs peuvent varier dans leur approche des principes. Parce que l'utilisation de l'innovation dépend en grande partie du niveau du public et des connaissances de l'enseignant sur les compétences méthodologiques. Par conséquent, chacun peut déterminer et prendre en compte les principes en fonction de sa signification et de son expérience. Quiconque ne connaît pas l'héritage pédagogique d'éminents penseurs et éducateurs azerbaïdjanais Akhmed Seidov, Mehdi Mehdizade, Mardan Muradkhanov, Yusif Talibov, Zahid Garalov, Yahya Kerimov, Bashir Akhmedov, ne peut pas entrer dans l'interprétation scientifique de l'éducation nationale azerbaïdjanaise. En effet, l'expérience et les points de vue théoriques de l'éducation azerbaïdjanaise du XXe siècle, les réalités méthodologiques pratiques et la solution des problèmes pédagogiques nationaux se sont reflétés dans les travaux et les études d'autres pédagogues nationaux, qui sont devenus leurs successeurs et sont devenus la propriété de milliers d'enseignants. En conséquence, une riche expérience éducative nationale et des sciences pédagogiques ont été formées.

La connaissance du patrimoine pédagogique national créé permet de comprendre correctement ses tendances actuelles de développement et de renouvellement. Parce que l'éducation en tant que domaine spécial de la vie publique est fondée sur des valeurs sociales, économiques et morales nationales spécifiques. La force et la portée de l'éducation résident dans sa mise en œuvre par des professionnels qui connaissent tout cela.

La dénomination de ces noms n'est pas venue d'une idée théorique, mais de la pratique - de l'expérience d'apprentissage. Si un enseignant qui connaît parfaitement son travail et travaille de manière créative développe et applique dans sa pratique une méthode qui permet une activation entre les élèves, il peut le nommer lui-même. L'émergence d'innovations pédagogiques et leur application dans la pratique est une question de notre étude. À cet égard, la recherche V.I. Zagvyazinsky et I.M. Kurdyumova est très intéressant.

Décrire le flux d'innovation répandu.

- avec une formation en plusieurs étapes et séparée (éducation);
- avec la transition vers un nouveau curriculum multidimensionnel;
- liberté de choix des sujets et de la portée de leur étude;
- avec le développement et l'expérimentation de nouvelles technologies de formation;
- avec l'inclusion de manuels alternatifs;
- avec un libre choix du contenu des supports pédagogiques, des formes d'organisation de l'enseignement et des méthodes d'enseignement.

L'auteur présente la séquence suivante d'innovations pédagogiques: début, approche, croissance rapide (dans la lutte contre les adversaires et les sceptiques), amélioration, assurant une promotion plus ou moins poussée de la pratique, une combinaison de crise et d'innovation en soi, nouveau système de finition plus efficace et plus général. DANS ET. Zagvyazinsky identifie deux options pour le développement et l'application de processus innovants à l'école primaire:

Je option:

1. L'émergence d'un nouveau concept avec le principe d'utilisation dans certains cadres et dans certaines situations.

2. L'élargissement du concept et de la portée de son application et, dans certains cas, la nécessité d'une généralisation et d'une exclusivité. Un exemple de ceci est un concept significatif et utile de la formation progressive de l'activité mentale, de la formation problématique et programmée.

3. L'adoption constante d'un concept pratique, la dépendance à celui-ci et l'attente d'un miracle.

4. Le concept, qui a été mis en pratique, commence à fonctionner, mais aucun miracle ne se produit, l'attente et le désespoir commencent.

5. La théorie est améliorée, les méthodes sont adaptées à la situation actuelle. Par exemple, la structure éducative en développement et ses capacités se sont considérablement développées pour devenir une tradition modernisée.

Option II:

1. L'émergence de nouvelles approches, le développement de nouvelles idées, une recherche complexe de moyens de les mettre en œuvre dans des outils méthodologiques. Ainsi, les systèmes pédagogiques de V.F.Shatalov, I.P.Volkov, S.N.Lysenkov ont été créés.

2. Lutter contre le passé récent, souvent pour l'approbation et la reconnaissance de l'innovation.

3. Il est vrai que plus ou moins de revendications d'universalité sont

présentées, mais pas pour chaque système innovant, mais seulement pour quelques-uns. Il est très important que cela dépende de la culture générale du système, y compris la position de la pratique de masse. Dans de nombreux cas, l'innovation est considérée comme une panacée.

Ces situations sont importantes pour la recherche et nous permettent de conclure que le processus de maîtrise des innovations est complexe, ce qui est important car l'enseignant comprendra l'importance de développer des innovations, comment les rechercher, les choisir et les appliquer. Dans le système de formation continue complète, la tâche de l'université est de préparer l'enseignant à une telle activité. L'Institut pédagogique, qui comprend le Lyceum-College-Institute, est capable de satisfaire habilement tous les besoins de la société, reflétant l'expérience accumulée. Ainsi, l'innovation pédagogique nous permet de considérer l'activité pédagogique comme une activité complexe. Les termes «innovation» et «innovation» sont considérés comme synonymes. Ce qui est nouveau dans la pédagogie, ce ne sont pas seulement les idées, les approches, les technologies qui n'ont pas encore été mises en avant par une telle combinaison dans la situation présentée, mais aussi le processus pédagogique élémentaire, qui a également un début pédagogique progressif, une solution plus efficace au problème de l'éducation et de l'éducation.

«Innovation» et «innovation» est le processus de maîtrise de la créativité. Dans la littérature scientifique, l'innovation est définie comme un changement ciblé. Le processus d'innovation signifie une activité systématique globale pour la création, le développement, l'utilisation et la diffusion de l'innovation.

Le processus d'apprentissage doit être entièrement repris. Ici, nous avons à l'esprit les éléments suivants:

1. Améliorer le contenu de l'éducation;
2. Utilisation efficace des méthodes d'enseignement actives;
3. Humanisation des relations entre l'enseignant et l'élève;
4. Impliquer les parents dans l'apprentissage des élèves;
5. L'utilisation des technologies d'enseignement modernes dans la formation, etc.

À la suite de l'étude, je voudrais noter que les innovations et les innovations utilisées dans le processus d'apprentissage à l'école primaire attirent l'attention comme condition clé pour améliorer la qualité de l'éducation. Le processus d'apprentissage doit être entièrement repris.

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MODERN MUSIC EDUCATION IN THE CONTEXT OF INCREASING RATES OF INFORMATIZATION OF THE EDUCATIONAL PROCESS

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The article discusses musical-computer technologies, as one of the fairly new and promising areas of music education in the system of additional pre-vocational as well as higher education. Musical computer programs and their main features that any musician can use in their creative or pedagogical activities are also described in detail.

Keywords: musical-computer technologies, new technologies in music education and creativity, digital tools of a modern musician-teacher.

Training in information technology in music is one of the most important areas in the field of musical-computer technologies, and is considered today as the most important component of education. The professional training of future specialists in the field of musical-computer technologies should be oriented towards the training of a competitive specialist in demand in the labor market in the context of the increasing rate of informatization of education, the creation of a unified information environment and the formation of relevant professional competencies in the context of rapidly developing capabilities of musical products and solutions in the field of musical- computer technology.

Today, every musician who mastered information technology uses them in creating and writing musical compositions, preparing scores, creating teaching aids, etc.

To do this, there is a huge number of music programs, thanks to which you can record, edit, or simply create a musical composition from scratch. These programs contribute to the development of limitless possibilities, both for musicians and composers.

The technology of music programs has reached the point where, thanks to the programs, you can edit the midi score, overlay various effects on it, translate it into audio format and do the final mastering. All of the above is just one thousandth of all that a composer can do using music programs.

Any idea and fantasy of the composer can be fulfilled with the help of music programs. Music programs can reproduce any instruments, sounds and noises.

For example, FL Studio or Fruity Loops - is a program for writing music. This is a powerful DAW (digital audio workstation) tool that has become popular all over the world. Since its inception, it has been distinguished by originality, both in terms of workflow and interface design.

This program is supported on different operating systems, but it is best optimized to run on Windows (FL Studio 12 is ideally optimized for Windows 10). At the moment, the program is one of the most popular digital music studios. Using FL Studio, you can create a work of almost any genre. There are various versions of the program, currently the current version is FL Studio 20. System requirements are still low and acceptable for most devices. This program is easy to use even for new users: accessibility, ease of use. If you need at least some skills to use more professional sequencers, then this program will not create problems even for a novice musician. In addition, for those who are at odds with English, the latest versions of the program are completely translated to Russian; the program uses quite complex algorithms for playback in its work; There is a parametric equalizer and an advanced mixer that supports about a hundred tracks, where each track gives the musician the opportunity to apply up to 10 special effects on it.

The manufacturer - Image Line Software - offers DAW with many plugins. The program contains its own virtual instruments (VST-plugins), and has the ability to connect third-party instruments from other developers.

In working with the studio, you can separate the windows and move them to the right place, dock, compress and enlarge. Moreover, the application allows you to configure your own scaling, both for the main window and for the mouse cursor, that is, you can change the scale for large or small screens. A graphical approach is essential for usability and overall usability.

The main windows for working in the program: a window with a library of samples, presets and folders; pattern window - here are the instruments for further recording notes in the Piano Roll menu open; sliders to adjust the overall volume and overall tone of the composition; playback control panel: metronome, switching between pattern and playlist play-

back, play button, stop button, record button, window for adjusting the tempo of a song); a window with a dial, where the duration of the composition is displayed by time (it is configured for the duration by measures); main buttons for navigating between windows: playlist, pattern window, piano roll, mixer; mixer window. You can assign one or several instruments to each track at once; window for adding effects to the mixer track.

Reason 5 - is another DAW program for creating and recording music. Reason was successful thanks to its intuitive, simple and realistic recom interface, as well as its incredible stability among many DAWs.

This program is supported on Windows and MacOS operating systems. From the beginning of the creation of the program to the present, Reason has 11 versions of programs. The system requirements for the program are low, which makes it accessible to users of both new and older computers.

Reason is a complete program that includes a large number of instruments, effects, utilities, a library of samples and presets for creating music, both for beginners and professionals. At the heart of Reason's work are audio signal transmissions and CV voltage control inherent in semi-modular and modular synthesizers. This program can be used not only as a sequencer and virtual recording studio, but also for live performance, or for recording instruments using external sequencers, using Rewire technology. Unlike FL Studio, Reason does not provide the function of connecting third-party virtual instruments (VST-plugins). This program uses instruments of its own format - Rack Extension plugins.

The whole design and working principle of the instruments of this program resembles a rack studio. In this virtual wreck, you can add instruments and effects for them. The list of available virtual instruments includes: synthesizers, samplers, effect processors, step and graphic sequencers. To switch to the "back side" of the rack, use the Tab key. As on a real rack, we can see the cables that connect the instrument and effects windows to the mixer.

The main windows for working in the program are significantly different from the FL Studio program: rack rack, which adds instruments for outputting an audio signal, a mixer, plug-ins with instruments, as well as plug-ins with effects; the main window, which allows you to edit both individual instruments and the full composition in the right window; panel for switching between piano roll modes for each instrument and the main composition window; panel with tools for editing material; a window for working with a composition, where all individual instruments are organized into one composition, etc.

The back panel of Reason, with which all instruments, effects are associated with the mixer, it also resembles the appearance of a rack.

For writing musical scores there is a very convenient program MuseScore. This is a music editor program that supports a wide range of formats and methods for entering musical text. This application is a very good analogue to more famous music editors such as Finale or Sibelius, and is not inferior to them in the main functionality. MuseScore is a free program and is supported on all major operating systems: Windows, MacOS and Linux.

MuseScore supports input functions from both the computer keyboard and MIDI keyboard. There are functions for changing the appearance of the program and the appearance of the score itself. The functionality of the program can be expanded by using additional plug-ins.

MuseScore can be turned into a kind of sequencer, with which you can already create songs inside the program. To do this, download the SoundFont library. The program has a mixer for adjusting the volume and balance of instruments, as well as the ability to add sound effects.

MuseScore has the ability to import and export to a large number of formats. The standard format for this program is .mscz, it is the preferred format because it does not take up a large amount of memory and can also support images. It is also possible to export to .mxl and .xml formats, which will give a chance to open the score in other music editor programs (for example, Finale or Sibelius). Export and import of MIDI format is supported, however, since MIDI is not designed to transmit notes on a staff, most musical text may not even be reflected when exported. Another interesting export tool is export to formats for other programs. So MuseScore can export scores to formats for the programs Band-in-a-Box (.mgu, .sgu), Guitar Pro (.gtp, .gp3, .gp4, .gp5, .gpx), Capella (.cap, .capx), Overture (.xml). Audio files are exported to WAV, MP3, OGG or FLAC formats. Export for storing scores or printing is done in PNG or PDF formats, and the score can also be printed directly from the program.

MuseScore is also an online platform where everyone can share their music or score.

Today, almost every musician uses digital technology in his work. Due to the large number of digital instruments (computer programs), the possibilities of modern musicians are almost limitless. The direction of musical-computer technology is one of the fairly new and promising areas of music education as in the system of additional pre-vocational as well as higher education, which provides training for socially and professionally competent musicians in the rapidly changing space of innovative cultural trends and technological processes.

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THE CONCEPT OF THE NOVEL AND THE NATURE OF THE IMAGE

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This article analyzes the novel "Golden Stainless" by the People's Writer of Uzbekistan Shuhrat. In the article, the author mainly talks about the secondary image in the novel and its role in reminding the author's concept. Also, the image of Aziza analyzed in the article is compared with the image of Rana, the protagonist of Abdullah Qadiri's novel "Scorpion from the Altar". In addition, the researcher used materials related to the novel "Golden Stainless" at the State Museum of Literature named after Alisher Navoi in the analysis of the image.

Keywords: Author, novel, concept of personality, secondary image, comparative analysis

For almost a hundred years (in Kadyri's own words), the first Uzbek novel "a little experience, or rather, a passion" still serves as a benchmark in our national novel "Days Gone By", and this novel is not only Uzbek writers, but also representatives of relativeliterature, for which it is still serving as a school of skill. This creative effect can be seen in Shuhrat's novel the "Golden Stainless". Literary critics have noted in their observations that the great writer's artistic skills, language and style have left a significant mark on the poetics of "Golden Stainless" [1, 11; 2, 69]. However, they did not seem to intend to delve deeper into the matter, and limited themselves to comparing the two writers' styles in the Days Gone By and the Golden Stainless. However, in "Golden Stainless" the author not only studied the versatility of the plot of "Days Gone By", the drama of events, the ability to use sharp turns of events to depict the characters, but also used the skills of creating a series of images in "Scorpion from the Altar".

"Golden Stainless" has a number of plot lines. While the main line is the socio-political direction at the center of the Faithful, the auxiliary line appears in the reality of the love of the Almighty and the Saints. These two plot directions are indirectly connected to each other, and when it comes to the third part of the novel, an additional line is attached to the main plot.

It is safe to say that the traditional trio of Salih Makhdum – Rano – Anvar in “The Scorpion from the Altar” and Mirsalim – Aziza – Qodir in “Golden Stainless” gave a new breath to literature with its originality.

“The novel is, by its very nature, a historical genre; In Belinsky’s words, it should be an epic of the time, a concept formed in it, a whole, a complete life and a person” [3, 85]. The concept of personality, on the other hand, undoubtedly prevails in the image of the protagonist. Auxiliary protagonists, together with the protagonist, play an important role in revealing the idea of the work. In each play, the characters live, breathe, have their own destiny. They appear in different situations in the play, depending on the purpose of the writer.

In his autobiography, two words about myself, Shuhrat writes of the characters in the “Golden Stainless” [4, 9] We can say that the image of Aziza in the novel is one of the characters “woven by the author himself.” So, what “position” did Aziza occupy in the novel? What task did the writer assign to Aziza? It can be said that Aziza is not the main character in “Golden Stainless” has a significant place, one plot line of the novel is connected with it.

Although she is a komsomol girl by faith, her demeanor is reminiscent of Rano in the “Scorpion from the Altar”. Look at this, both girls are born into a family of hypocritical, ignorant teachers in quotes and are raised as male boys under the shelter of their loving grandmothers. It was difficult for righteous and virtuous children to grow up in the families where the girls we were talking about were born, ”Qadiri said. A similar thorny wood, Rana, was created with a fragrant, delicate appearance,” [5, 318] says Shuhrat Aziza, “a nightingale came out of a thorn bush” [5, 21].

Although Mahdum did not like Anvar at first, he later became disillusioned with his “successes” and began to consider him a worthy groom for his daughter. But when the suitors come from the khan, he is not tired of sacrificing his daughter’s happiness in this way, not knowing what to do. Look at the similarities, Mirsalim also jumps at first when he sees his daughter Aziza walking arm in arm with Qadir on the street. He then imagines Qadir’s official brother, Sadiq, and paves the way for their relationship.

Later, when Sadiq is imprisoned, he facelessly disrupts the relationship between the lovers. But this relationship was not a youthfulness, as Mirsalim thought, but an unbreakable bond. In both novels, the girls are combative, self-aware, and active. If in “The Scorpion from the Altar” Rana left her father’s house “ashamed of lying in the khan’s filthy bed” [5, 412], Aziza will leave the house after her father’s impurity. The fact that Mirsalim

Sodiq, an unscrupulous diocesan who drove his conscience away, drove his elderly mother out into the street and forcibly took over their house, leaves the girl in disgrace. By showing the spiritual difference between a father and a daughter, the writer describes how low Mirsalim is, while at the same time the girl is spiritually superior to her father.

It should be noted that the image of Aziza is not as bright as that of Rano. This is because of their place in the composition of the novel. Qadiri draws the portrait of Rana in detail with special love. Although Aziza has less weight in the novel than Rana, the writer adds more artistic burden to this character than to other characters. The writer shows the inner world of the character through a detailed description of Aziza from her childhood to the process of character formation

Aziza, who is now a thoughtful, courageous and free-spirited girl, moves in the play based on the logic of her character. And at the same time, his actions come in handy in the realization of the writer's creative plan.

So what does the author mean by this image, to what extent has this image been able to illuminate the writer's concept? We will look for answers to these questions in the text "Golden Stainless".

"It is clear from the memoirs about fame that the talented writer advised Shukur Kholmiraev as a teacher: "Read more French writers! They knew how to describe events and happenings in an interesting way!" [6, 183]. It is clear from the excerpt that the writer introduced an additional direction of the work, the direction of love, primarily to give the novel an adventurous character. As a result, the readability of the work has increased.

Second, the writer connects the love story of the lovers to the main problem of the novel in such a way that they turn out to be two friends and at the same time the daughter and brother of our protagonists, who are fierce enemies. This situation, in turn, serves as a leaven in the further escalation of the main conflict.

Third, Sadiq's childlessness reveals the past, character logic, and psyche of the two colleagues by comparing them to each other, emphasizing that Mirsalim is going through an only child. This detail gives a big impetus to the course of events and speeds up the next process. Most importantly, this is where the main conflict of the novel grows.

Fourth, Aziza is not sent to medical school for nothing. It has to do with the author's artistic intent. After graduating from medical school, Aziza goes to the front. At the time, Sadiq, who had escaped from prison by accident, was showing heroism in the war. Through the episode of being sent to the front, the writer turns Aziza into a witness to Sadiq's last days.

In general, the novel is rich in coincidences: the encounter of Dilovarkhoja in a loyal prison, investigators Chukhanov and Aziza in wars, and Kadyr in Pushkaryov and Mirsalim, as literary scholar Umarali Normatov rightly points out, has slightly damaged the novel's vitality [7]. But in our opinion, the writer had a clear purpose in bringing this scene into the work. After all, he could have described Sadiq's heroic death without Aziza's testimony.

The work of art is wounded by the writer's heart and soul, and if the interpretation is correct, he is as dear to the author as his child. Regardless of whether the work is royal or mediocre, the writer seeks to protect it from various calamities and to take refuge in it. Just as a mother hen keeps her chickens under her wings, she protects him from "extraordinary attacks."

He wants to emerge without casualties and reach out to the students. The biggest obstacle facing the writer is the selfish gaze of a bunch of ideological critics who are chasing censorship in order to prevent it from going beyond iron bars, patterns and stereotypes, and the evil weapon they carry is criticism. One of the main tasks of the writer is to leave them, to keep his work from being smashed. In this sense, by bringing the image of Shuhrat Aziza into the novel, it masks the contradictions of the main theme raised in the play – the cult of personality.

In order to get acquainted with the author's archive, we have to look at the manuscript of the novel "Golden Stainless" from the Archive of Glory Fund of the Alisher Navoi State Museum of Literature of the Academy of Sciences of Uzbekistan, the minutes of the 1964 discussion at the Writers' Union.

In the discussions, various conflicting opinions, suggestions and comments were expressed. For example, by mixing up the novel's intricate plot lines, he asked, "What is the work about? [8] "The Golden Stainless is a work that illuminates the theme of war, as it is devoted entirely to the depiction of war," he said [9, 215-220].

Apparently, the mask was justified in a sense. The question arises: why did the writer need such a mask, could he not have taken a different path? In our opinion, the first reason for this, as mentioned above, was the censorship of the work, and the second (and perhaps the main reason) is the fear in the heart of the writer, who has not "survived" from Stalin's prison for more than a decade.

After that famous XX Congress of the CPSU, those imprisoned as "enemies of the people" began to be acquitted. "After hearing the story of his brother from Almighty Aziza, he wrote an application to the higher authorities and pursued the case" [4, 390]. It is noteworthy that the author is not

emphasizing the Communist Party's congress that exposed Stalin, but "the Almighty who heard his brother's history from Aziza." The writer does not want to approach the person of Stalin, whose name was condemned at the XX Congress, by praising or criticizing him. That is why he witnessed the "glorious" death of Aziza Sadiq. He narrates the XX Congress only as a small piece of information.

So, this novel of Glory will be a unique school of experience in giving the contradictions of the time, reflecting the real reality. Like other works dedicated to repression, it plays a significant role in exposing the ugly face of the oppressive kingdom. There is no need to prove that every image depicted in the play is created on the basis of the important statements that each character the writer wants to convey to the reader. Even today, it calls for vigilance from those bloody times.

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GEOPOLITICS OF UZBEKISTAN: FACTORS AND PRAGMATIC FUNDAMENTALS

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This article is devoted to the theoretical and conceptual factors and pragmatic bases that determine the geopolitics of Uzbekistan. The article analyzes the geopolitics of Uzbekistan on the example of geographical determinism, demographic, historical, trade and economic, military, intellectual potential, regional ideas.

Keywords: Central Asia, Afghanistan, Heartland, Eurasia, One Belt - One Road, International North-South Corridor, SCO, Turkestan, Consultative Meeting

Introduction

The Central Asian region is a priority of Uzbekistan's foreign policy and Uzbekistan's geopolitical approach is to make Central Asia a safe, stable and developed place. As the President of Uzbekistan Shavkat Mirziyoyev said, "Uzbekistan today defines the Central Asian region as the main priority of its foreign policy. And this is a conscious choice. Located in the heart of Central Asia, Uzbekistan is directly interested in making the region a zone of stability, sustainable development and good neighborliness" [1]. In order to implement such a policy, it is necessary to consider the possibility of having and effectively using the potential tools provided for in geopolitical theories. That is why a comprehensive theoretical study of the role, influence, geopolitical potential and prestige of Uzbekistan in the region is of great importance. At the same time, the idea that the geopolitics of Uzbekistan is closely linked with the Central Asian region is being supplemented today with new and additional approaches.

Main results and findings

Although foreign scientific publications and experts have published a number of publications and articles on official Tashkent's regional pol-

icy, most of them are limited to a narrow interpretation of Uzbekistan's geopolitics or assessment of the region through the influence of foreign political forces. In our opinion, in the process of objective and objective assessment of the geopolitics of Uzbekistan, first of all, it is necessary to carefully study the theoretical foundations of the country's geopolitical location and its strategic role in the region. To do this, we consider it appropriate to cite a number of factors and analytical considerations:

Geographical determinism. The region where Uzbekistan is located is of great geopolitical importance according to various criteria. Uzbekistan is located in the heart of the strategically important Central Asian region of the world. This geographical view is directly identical to Mackinder's Heartland theory. In 1904, the English scientist H. McKinder published his report "Geographical pivot of history" in the "Journal of Geography". This lecture became the brightest geopolitical work in the history of science. H. McKinder believes that the most convenient geographical location for the state is its center. He noted that from a global perspective, the Eurasian continent is at the center of the earth, and the Heartland (Heart of the Earth) is at its center. Therefore, H. Mackinder put forward the following concept: "Whoever rules in Eastern Europe, he rules over Heartland, whoever rules over Heartland, rules the islands of the world, rules the islands of the world, rules the whole world"[2]. Chris Sipple, an expert at the Institute for Foreign Policy Studies, called Uzbekistan the geopolitical heartland of Eurasia [3], based on Mackinder's theoretical formula. He analyzed the balance of power in Central Asia and the practical geopolitics of Uzbekistan. Chris Sipple's main focus is on Uzbekistan's cooperation with the United States and Europe since 9/11. According to him, the United States realized the strategic importance of Uzbekistan in the Heartland only after 2001. An important proof of these views is that Uzbekistan is the only state in the region that shares a common border with all Central Asian states and Afghanistan. More precisely, it is clear that Uzbekistan's foreign policy decisions will in themselves influence the geopolitical direction of the region. This requires serious consideration of the geopolitical position of Uzbekistan in the region by the leading power centers. Assessing the impact of external forces on Central Asia, V.V.Paramonov noted that regional and global states view the region on the basis of geopolitical regionalism and as the only geopolitical space where political and economic interests are intertwined between the Eurasian power centers [4]. Moreover, in this geopolitical space, only Uzbekistan is the only country in the region that is naturally protected from the direct influence of such power centers. To be more precise, Uzbekistan does not have a direct

border with power centers in the region, such as Russia, China and Iran. At the same time, such a geopolitical status imposes on Uzbekistan the responsibility to ensure the balance of power and mutual internal stability in the region.

Uzbekistan is a country in the region surrounded by four nuclear powers (Russia, China, Pakistan and India). Realizing that the nuclear factor could become a tool of military-political influence and pressure on the region, official Tashkent initiated the Treaty on a Nuclear-Weapon-Free Zone in Central Asia (Semipalatinsk, September 8, 2006). There is every reason to believe that this agreement is the first step in building not only a regional, but also an international security system of the XXI century.

In describing the factor of geographical determinism, it should not be overlooked that Uzbekistan is located at the crossroads of strategic corridors. Uzbekistan is an important ring of transport and communication corridors that can connect Europe with Asia, Central Asia with South Asia, the Far East with the Middle East. The First President of Uzbekistan Islam Karimov once said that there are dangerous aspects of such a geostrategic location: "Uzbekistan is located practically in the strategic center of the semicircle, along which the richest oil and gas deposits of the Persian Gulf, the Caspian Sea and the Tarim Basin are located, that is, energy resources, under the conditions of the global energy shortage, which are called upon to play a decisive role in the coming years in the future of Eurasia and in general of the world" [5]. In this sense, the geopolitical situation in Uzbekistan means that it must find its place in interregional transport and transit systems. Historically, the main routes of the Great Silk Road passed through the regions of Uzbekistan. The prospects of such large-scale projects as the One Belt One Road, the International North-South Corridor, aimed at restoring the modern Silk Road, undoubtedly depend on the recognition of Uzbekistan's role as an interregional transport and transit crossroads.

Demographic dominance. The role of the demographic factor among the categories of geopolitics also has high advantages. The peculiarity of the demographic factor is that it can affect all elements of geopolitics. For example, the large population, the number of workers is the basis of the country's economy. Second, the population factor allows the state to choose the geographical space without borders. Third, demographic potential is a source of increasing military capacity. F. Rattsel's theoretical views that demographic processes are a traditional and constant means of influence of geopolitics are still relevant. In his view, the demographic factor determines the nature and direction of geopolitics. A small popu-

lation leads to a decline in development, easily invading the state. And conversely, having a large population offers significant opportunities to expand their living spaces [6].

Uzbekistan is the most populous country in the Central Asian region, and according to the State Statistics Committee in January 2020, the country's permanent population is more than 33 million 960 thousand people [7]. This is closer to about two-thirds of Central Asia's total population. Experts believe that the growing population in Uzbekistan will further increase the role of Uzbekistan not only in Central Asia, but also in the CIS. For example, comparing the population of the post-Soviet space, the Russian expert A. Kazantsev writes: "Considering the aging population of Ukraine and low birth rates, on the one hand, and high birth rates and a very young age structure in Uzbekistan (up to 70% of the population are young people), this country will become second in the post-Soviet space in terms of population size very soon. It is geopolitically significant that the post-Soviet space is becoming more "Asian." Kazakhstan has long become the second post-Soviet state in terms of absolute GDP, overtaking Ukraine in this indicator. After Uzbekistan takes the 2nd place in terms of absolute population size, the relative role of the European part of the post-Soviet space will decrease even more" [8]

Another noteworthy aspect is that Uzbekistan has the largest population in the region. Today, more than 130 nationalities and ethnic groups live in our country. Today, all nations and peoples of Uzbekistan live in peace. All the necessary conditions have been created for them to live in harmony and without any problems. The activities of 138 national cultural centers (NCCs) established in Uzbekistan play an important role in this. 14 of them have the status of the Republican NCC, there are 23 NCC in Tashkent, 6 in the Republic of Karakalpakstan and 96 in the regions [9]. Taking into account the specifics of the region, it can be said that the stable policy pursued by Uzbekistan in interethnic relations provides an opportunity for active and effective cooperation with the countries inhabited by these nations and peoples. This will undoubtedly significantly reduce the geopolitical influence of the major powers on the Central Asian region as a means of interethnic relations.

A factor of military power and regional security. Uzbekistan is one of the leading countries in the Central Asian region in terms of military power, which is one of the strongest tools of geopolitics. According to the Global Military Power Index 2020, Uzbekistan ranks 52nd out of 138 countries in the world, 23rd out of 45 countries in Asia, and is the most powerful among Central Asian countries. According to the report, the ac-

tive troops of Uzbekistan amount to 50,000 people, including 420 combat tanks, 185 aircraft (including 66 fighter jets), and 79 helicopters (including 25 attackers) [10]. Among Central Asian states, only Uzbekistan served as a geographical and military shield against the threat posed to the region by the civil wars in Afghanistan and Tajikistan in the early 1990s. The establishment of the SCO Anti-Terrorist Structure in Tashkent in 2004 as a result of changes in the regional security system of Central Asia at the beginning of the XXI century also confirms this idea in practice.

Historical factors. The history of Uzbekistan is the history of great civilizations and empires. In the past, Samarkand, Bukhara, Khiva, Tashkent, Shakhrisabz and other influential cities of Uzbekistan were the centers of political, trade, economic, cultural and educational development of the ancient Central Asian regions. Well-known American political scientist Z. Brzezinski also emphasizes the historical prestige of Uzbekistan: "In fact, Uzbekistan is the main candidate for the role of a regional leader in Central Asia ... The country's political elite deliberately calls the new state a direct descendant of the huge medieval empire of Tamerlane, whose capital Samarkand has become a famous regional center for the study of religion, astronomy and art. This circumstance strengthens in Uzbekistan a deep sense of its historical continuity and religious mission in comparison with its neighbors" [11]. Indeed, the glorious history of Uzbekistan allows us to understand its important position for the future of the region.

Trade and economic opportunities and natural resources. Uzbekistan is one of the leading countries in the economic development of the region. Uzbekistan is the largest market in Central Asia with the largest population and convenient geostrategic location. It can be said that the Uzbek market is the gateway to the entire Central Asian market. The fact that the prestigious British magazine *The Economist* recognized Uzbekistan as the "Country of the Year" [12] in 2019 is a unique recognition in this regard. The World Bank's January 2020 Global Economic Outlook report predicts that Uzbekistan will have the highest GDP growth rate in Eastern Europe and Central Asia at 5.7% in 2020 and 6% in 2021-2022 [13]. A World Bank report published in June 2020 predicts that despite the coronavirus pandemic, Uzbekistan will remain the only country in Eastern Europe and Central Asia in terms of positive economic growth throughout the year in the coming years [14].

Uzbekistan has huge geostrategic reserves of natural resources. There are 3,000 mineral deposits in the country, of which 1,100 are ready for mining, including 50 original, 41 non-ferrous, rare, radioactive and ferrous metals, 187 fuel and energy, 19 mining chemicals, 45 mining raw

materials. , as well as building materials, groundwater and other mineral deposits. The prospects of Uzbekistan's mineral resources are huge. Only 20% of Uzbekistan's territory has been explored. In particular, 86 oil fields of industrial significance have been discovered in Uzbekistan, of which 36 are oil, 24 are oil and gas and gas-oil, and 26 are oil and gas condensate fields. The country ranks fourth in the world in terms of proven gold reserves and ninth in terms of production. Uzbek geologists have discovered the largest stockwork deposit (Muruntau) in Eurasia. Uzbekistan is a leader in Central Asia in terms of proven copper reserves and mining. 12% of the copper deposits are in the South Tianshan, 80% in the Middle Tianshan and 8% in the Gissar fold system. In terms of uranium reserves, Uzbekistan ranks 7-8th in the world [15]. The country has huge reserves of other types of minerals. This is one of the criteria of Uzbekistan's geo-economic potential.

Intellectual, cultural and educational potential and regional ideas.

Uzbekistan is a land of immense intellectual potential, which has made a significant contribution to the development of world science and culture. Uzbekistan is also one of the cradles of civilization of the Islamic world and other religions. Today, the intellectual potential of the Republic is developing rapidly. Radical reforms are being carried out in Uzbekistan to develop the education system, discover talented young people and, in general, to further advance science. In this regard, as noted by the President of Uzbekistan Shavkat Mirziyoyev: "Uzbekistan should become competitive on the world stage in the field of science, intellectual potential, modern personnel, high technology" [16]. It should be noted that the factor of national and regional ideology is also one of the important elements of geopolitics in Uzbekistan. Uzbekistan's regional ideas embody the principles of joint cooperation and joint solution of problems in the region. In the past, the idea of "Turkistan - our common home" was put forward. The idea of organizing a summit of "Central Asian leaders Consultation meeting", developed today at the initiative of official Tashkent, can be cited as evidence of the above.

It is impossible not to include the **Afghan factor** in the list of factors listed above. The full radius of Uzbekistan's geopolitics will be further expanded due to the Afghan factor, which is one of the priorities of the country's foreign policy. Modern trans-Afghan projects, such as the Mazar-e-Sharif-Herat and Mazar-e-Sharif-Kabul-Peshawar (Kabul Corridor) projects, which allow Uzbekistan to access the Persian Gulf and South Asian seaports through Afghanistan, are distinguished by their geopolitical features.

Today, Uzbekistan pursues a pragmatic geopolitics to effectively use its opportunities and potential, to solve existing problems faster. As a result of the initiatives and practical efforts of the President of the Republic of Uzbekistan Shavkat Mirziyoyev, a new climate of geopolitical confidence has emerged in Central Asia. The fact that a number of problems between the countries of Central Asia are declining is closely linked to the efforts of Uzbekistan. In this sense, the following regional and international events, which have become a pragmatic expression of the geopolitics of Uzbekistan, can be cited as examples:

- Consultative meetings of Central Asian leaders;
- Samarkand International Conference "Central Asia: Common History and Common Future, Cooperation for Sustainable Development and Progress";
- Tashkent International Conference "Central Asia in the system of international transport corridors: strategic prospects and untapped opportunities";
- Tashkent International Conference on Afghanistan "Peace Process, Security Cooperation and Regional Partnership".

It should be noted that the Consultative Meeting of Central Asian Leaders, initiated by the leadership of Uzbekistan, was held on November 29, 2019. It is also a pragmatic achievement of Uzbekistan's geopolitics that all the leaders of the region met at the same meeting in Tashkent for the first time after a long annual break without the participation of major powers. In turn, the international documents adopted on the initiative of Uzbekistan play an important role in strengthening the legal framework for stability and development of the region as a whole:

- UN General Assembly Resolution "Strengthening regional and international cooperation to ensure regional peace, stability and sustainable development in Central Asia" (June 22, 2018);
- Tashkent Declaration "Peace Process, Security Cooperation and Regional Partnership" (UN General Assembly, March 29, 2018);
- UN General Assembly Resolution "Sustainable Tourism and Sustainable Development in Central Asia" (December 19, 2019);
- Joint Statement of the Consultative Meeting of Central Asian Leaders (UN General Assembly. December 19, 2019).

Conclusion

Commonly accepted geopolitical views show that Uzbekistan is the geopolitical core of the Central Asian region. In this regard, issues such as in-depth analysis of the theoretical and pragmatic foundations of geo-

politics of Uzbekistan will always remain relevant and relevant. In general, the following conclusions can be drawn from the study of geopolitics in Uzbekistan:

1. The set of factors of geographical determinism, demographic, historical, trade-economic, military, intellectual potential, cultural-enlightenment and regional ideas allows to theoretically substantiate the geopolitics of Uzbekistan.

2. Central Asia and Afghanistan are the priorities that make up the geopolitical radius of Uzbekistan.

3. Analysis of the factors determining the geopolitics of Uzbekistan means that these factors can have both a constructive and destructive impact on Uzbekistan. Therefore, in the future, the geopolitical prestige of Uzbekistan will be closely linked with the effective use of constructive opportunities and the prevention of destructive factors. Ўзбекистон геосиёсати минтақавий хусусиятига эга бўлиб, у минтақага ҳарбий-сиёсий босим ўтказиш механизмларини тамомила рад этади, аксинча минтақада барқарорлик, тараққиёт ва ташқи кучларнинг ўзаро мувозанатини таъминлашга асосланган сиёсатни устувор, деб ҳисоблайди.

4. Due to the geopolitical movements of Uzbekistan, the Central Asian region, including Afghanistan, is becoming an object of international policy. Uzbekistan, as an active subject of these geopolitical processes, is mobilizing its potential and capabilities.

5. Factors of geopolitics of Uzbekistan set important goals and objectives, such as the widespread promotion of its geopolitical attractiveness to the country.

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SHORT HISTORIOGRAPHY OF PAINTING OF «SEVERE STYLE» IN THE USSR

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Judgment of the difficult cultural and art phenomena proceeding in development of the Soviet fine arts from Khrushchev's "thaw" to Post-Soviet "decadence" went a long way for the last 30 years. More precisely – researchers stated extreme views, from banal ascertaining of the single phenomenon in the general context of the Soviet art of the sixtieth years, by fixing of its art value through concrete works in the seventieth and, finishing hot polemic in the late eighties – the ninetieth years. A large number of the publications which appeared in 1980 – 1990 – x years in which the phenomenon of "severe style" is investigated, confirm more serious analysis of this phenomenon of the Soviet art in comparison with the previous decade of interesting searches of men of the seventies, for the period of "severe" which covered creativity. Persistent interest in the Soviet fine arts 60 – 70 – x for of the XX century is presently a natural consequence of change of cultural paradigms and shows confusion before diversity and diversity of the modern fine arts. Therefore, first of all, the ideological and art programs of "severe style" setting a vector of the movement from a publicistic

expression in its early period to religious philosophically art judgment of problems of life in the next decades have to become a subject of a serious art criticism research.

Keywords: Soviet art, socialist realism, severe style, men of the sixties, iconography, romanticism

Introduction

In particular, to the fine arts of the Soviet period, very many publications, both in the second half of the XX century, and during the late Post-Soviet period are devoted to the great Soviet culture of the 20th century. The era of socialist enthusiasm of "a storm and an impact" attracted and involves to itself many art critics with brightness power, passionarity of the proceeding cultural and art processes defining new quality of the Soviet bytiyny space. Judgment of the difficult cultural and art phenomena proceeding in development of the Soviet fine arts from Khrushchev's "thaw" to Post-Soviet "decadence" went a long way for the last decades. Researchers stated very extreme views, from banal statement of the single phenomenon in the general context of the Soviet art of the sixtieth years, by fixing of its art value through concrete works in the seventieth and, finishing hot polemic in the late eighties - the ninetieth years. Quite considerable number of publications 1980 - 90 - x years in which the phenomenon of "severe style" is considered "under a microscope", obviously speaks about the deep and serious analysis of this phenomenon of the Soviet art in comparison with the previous decade of interesting searches of men of the seventies, for the period of "severe" which covered creativity. The new surge in great interest in the Soviet heritage in graphic creativity 60 - 70 - x of the XX century during our postmodern period obviously demonstrates the serious crisis which arose owing to change of cultural paradigms which shows lostness of society before loudly "shouting" diversity of modern graphic language and art. [1.]

Research objective

Today need of identification of ideological and art reference points of the creative positions of "severe" artists which influenced addition becomes more and more relevant. This relevance is caused, first of all, by critical accent which was present earlier at a research of domestic culture of the XX century where the main emphasis was placed on insufficiently studied or very contradictory problems. Though, gradually there is a positive trend of more objective, "out of political" judgments of many already known processes. Proceeding from the aforesaid, special importance is gained by use of the system approach synthesizing together achieve-

ments of early domestic art of 1910 - the 1930th and all world cultural and art fund. Original synthetic creative thinking of representatives of "severe style" managed to transform harmoniously art practitioners of various traditional styles and the directions which were divided centuries from each other. Many artworks of masters of "severe style" bear in themselves not only some peculiar features of author's originality. Often they create own cultural and art space filled with original innovative experiments. In our opinion, "severe" as if would stretch ropes with which pulled together practice of pre-revolutionary and post-revolutionary art of the 20th century and heritage of Old Russian and European creativity of old masters. For this reason, it is necessary to study attentively rich cultural and art heritage of the late Soviet period (especially 60 – 70 - x of the 20th century), having separated, so to speak, "grains from a ryegrass", selecting everything the most valuable to preservation of general historical cultural space of a uniform Russian civilization.

Results of a research and their discussion

The Soviet art creativity of the 60-80th years, including, generated the strong, outstanding works relating to so-called "severe style". The art phenomenon of masters of "severe style" personified the most interesting cultural and religious movement of the Soviet fine arts of the second half of the 20th century which marked the beginning of new development of domestic painting and had significant effect on its further development. For the fiftieth anniversary at assessment of "severe style" as any large art phenomenon, various judgments express. This direction gave rise earlier and generates the mass of contradictory opinions today. At the same time, fixed attention enthusiastic recognition of its special role in the history of the Soviet art - denial or underestimation of its importance was replaced by oblivion, and. Today the next round of interest concerning painting of "severe style" during which articles and monographs are written is noted, catalogs of works are published, and cloths are exhibited at structure of the largest exhibitions and at Russia and around the world. Especially It should be noted the interest shown by the famous private collectors and auction houses to painting of masters of "severe style" that emphasizes once again timeless a continuum of this genre. As designers (architects-artists), we can draw a rough analogy: severe style in painting, it is kind of modernism (not to confuse with a modernist style) in design and architecture. Vulgar simplification should be considered that the severe style, having left socialist realism, became its logical continuation. By no means, the severe style is turned to Deyneki's creativity antagonistic to both vanguard and a formalism more likely. In this sense the severe style

should be considered original Russian painting, originally the "secular iconography" though which fell on the Soviet period. Speaking about execution, we would allocate the following receptions in this style: the large dabs but at the same time having a clear boundary because many works remind a panel, monumental painting. Original painting "severe" most often monochrome, a palette of works is intentionally limited, in works quite often use three - four primary colors. Special "rublennost" of forms is inherent in style, and even the easy floating clouds in pictures have concrete outlines and can remind geometrical objects. Compositions of pictures, as a rule, intentionally gruzna, kind of, "ordinary", and silhouettes deliberately angular, as if executed from a stone. To put it briefly, severe style - masterly executed "rough" professional painting. The severe style formally comes to an end approximately in the late seventies (having given an impetus to the subsequent artists), however its influence is big even today. It is worth looking at Yu.I. Bosko, N.P. Eryshev, E.A. Kazantsev, P.P. Kozorezenko, N.N. Krapivin, V.F. Samarin's works to make sure that the severe style became the special Russian picturesque direction. The first shy attempts to somehow define new art the direction arisen in painting of the 1960th years were made in parallel with the birth of this movement. So it was bright and unexpected. However, even before emergence of the first large "proto-severe" works, in the art criticism environment and in periodicals the issue of modern style of the Soviet painting was very violently discussed. The discussion lifted by the art critic of H.A. In 1958 [2., page 190] found Dmitriyeva the continuation during the round table organized by the Tvorchestvo magazine. This heated debate was directed to understanding of the processes happening in the late fifties in art of the USSR. Discussion revealed a number of formal criteria of modern style which distinctive features considered lapidarity, monumental generality, a picturesque graphics and an expression of an art form. These quite exact trends shown in painting of the younger generation of artists were called by Alexander Kamensky terms: "severity", "courageous simplicity", "severe truth". [3.] Definitions were at once picked up by art criticism and began to appear in various publications. Finally the phrase "severe style" was practically fixed in terminology of art critics at once after issue of Article A. Kamensky "Reality of the metaphor" published in the «Tvorchestvo» magazine for 1969. [4] It should be noted that the term "severe style", as well as any term in the history of arts, it is necessary to understand very conditionally as it covers too wide range of names and quite considerable historical piece. There was this term, most likely, on a wave of penetration into the sphere of art criticism of fashion for lessons of the French "formal

school" in philosophy and an esthetics, for representatives which the category of style already was fundamental. For example, the world history of art seriously was understood by representatives "formal school" as history of styles. A.M. The cantor quite fairly noted the fact that the term "severe style" initially was given too "broad sense" owing to what began to call this term practically any art of 1950 - the 1960th years which though in something differed from the established formal "canons" of socialist realism. "It is clear that in this case it is impossible to speak about any uniform style, and the Soviet art, having hardly left from under guardianship, began to break into numerous streamlets at once" [5.], - the Cantor notes. Art critic of B.C. Manin also emphasizes, ambiguity and vagueness of outlines of "severe style" as the defining criteria of the "new" direction. "Certain masters left aside, but neither the right step, nor a left step led to death of all direction... it is also difficult to establish chronological limits of "severe style" which some representatives remained are faithful to themselves until the end of the 20th century, and others changed creative addictions", [6., page 10] - V.S. Manin writes. From here it is necessary to assume that "the severe style" is the certain certain "system of coordinates" describing esthetic, moral and style features of art phenomena. In other words, characteristic "severe" can express the certain semantic intonation arising from the aspiration to oppose naive and cheerful art of socialist realism and "special art" of young artists of an era of "thaw". To speak about "severe style" in its finished form (as about a concept) it is very problematic as in this art direction masters very diverse on the style preferences coexisted. Especially, according to authoritative opinion of B.R. Vipper one of essential signs of addition of new art style, disclosure of new style in different types of art always acts. And first of all, B.R. Vipper considered - in architecture: "when signs of style appear in architecture, it means that the style is formed". [7., page 12] In other cases, B. Vipper considered, it is possible to speak rather only about formation of the direction or certain general stylistic trends of this period of time. Proceeding from the aforesaid "the severe style" can be understood doubly, as in its narrow semantic value (mainly Moscow school), and in wide, including similar art manifestations in other regions and the Soviet republics. The scientific and popular scientific literature devoted to severe style published at a boundary of the 1990th - the 2000th years, dazzles with a variety, though includes serious researches. So on pages of the Tvorchestvo magazines [8.], "Art" [9.], "Decorative art", "Artist" - the questions connected with consideration of characteristics of the direction and definition of sign works were designated. [8.] In parallel with the critical works de-

voted to "severe style" appear as well the generalizing scientific research which is basic when studying dynamics of all direction in general. Approximately in the 1980th years when there was a certain historical distance, became possible to generalize the saved-up graphic material. A.A. Kamensky in the book "Romantic Installation" (1989) analyzes historical conditions, ideological and graphic features, the evolution which happened in creativity "severe" for 1950 - the 1970th [10., page 190] Kamensk also especially focuses attention on the underestimated aspects of "severe style", in particular on aspiration to metaphoricalness and width which the criticism did not notice even in "rather favorable responses". [10.] The serious and sound analysis of painting of "severe style" can be found in A.I. Morozov's works of the 1980th years. One of such important works book "Generations of young people. Painting of the Soviet artists of the 1960-1980th years", published in 1989. [11., page 17] the Author of this book investigates art of "severe style" from various parties, outlining a circle of the interests consideration of questions of continuity of works of painters of "severe style", revealing value of artistic touches of new artists, "severe" for the subsequent generations. Frosts in the book "The artist and the world of the personality. Creative problems of modern portrait painting" fixing the attention on features of a portrait genre of "severe", allocates a factor of enthusiasm for a certain "chamber form" and naive "pravdoiskatelstvo" which appears in works by men of the seventies, taking sources in painting of "severe style". [12., page 59] series of albums devoted to works and authors of "severe style" are born over time. From which, for example, especially It is necessary to distinguish work "Nikolay Andronov: Painting. Monumental art" D.V. Sarabyanova, and publication B.C. Manina who is devoted to Victor Popkov's painting. [13.] In addition, it is very useful to address a research of the Soviet phenomenon of "severe style" in numerous works of the western colleagues. So in the interesting monograph "The Soviet art: painting, a sculpture and architecture in the one-party state, 1917 - 1992", is devoted to a subject of art of "severe" Suzan Read's article "Memory art": retrospectivism in the Soviet painting of an era of Brezhnev" ("The "art of memory": retrospectivism in Soviet painting of the Brezhnev era"). [14.] The author of article in particular notes the fact that artists of "severe style" in the creative search processed usual subjects of socialist realism consciously to emphasize still big "severity" of real life. [14., river 165] Mathew Baum in the book "Art at Stalin" investigates the Soviet art at a boundary of 1950 - the 1960th years and already in the epilog "Art after Stalin, 1956-1990" ("Art after Stalin, 1956-1990") notes special "inevitability" of emergence of "severe

style". [15., river 230] Baum, in particular tells about the subsequent influence of this style and its further wide circulation in art of the 1960th at what, in very disputable opinion of the researcher, characteristic of this decade is more logical to consider this direction as special style of socialist realism. We are represented very disputable to consider art of "severe style" any branch of socialist realism as works by "severe" artists differed from the most characteristic cloths of the forthcoming period, both on formal, and on the ideological orientation markedly. In the most part of the researches published after "disintegration" by the USSR in the 2000th years in the Russian magazines on art, for example such as: "Academy", Artkhronika, "Dialogue of arts", "The Russian art", Tretyakov gallery, "The art magazine", a problem of terminology of "severe style", a problem of its chronology and further distribution, remains debatable (however, as well as semantic contents of the term). So, for example, the researcher A. Bobrikov in article "Severe style: mobilization and the cultural revolution" [16., page 30] quite safely calls the direction of "severe style" - the peculiar "Soviet Reformation". And, the author treats ideological and art programs of "severe" artists as "... individual experience of the main values of Bolshevik religion (including a historical mystery of Revolution and Civil war) - instead of collective execution of ceremonies". [16., page 30] Having made such bold statement, Bobrikov notes that over time in works by masters of "severe style" not attendees by it "seclusion and intimacy" began to be shown earlier therefore in their late works some works in the spirit of "peculiar silent "Biedermeier" appeared. [16., page 30] Youthful "severity", according to Bobrikov, was gradually transformed to certain "depressiveness", and slightly later in painting there was a natural drift to coast of "gloomy romanticism" or even certain "philosophy of despair". It can be observed in the so-called "Ferapontovo cycle" of artists of Nikolay Andronov and brothers Smolin. There are also more rigid opinions. In 2004 A. Kovalyov in the monograph "Introduction to art political economy of an era of "stagnation" stated the offer to mean by the term "severe style" in general two separate options of style which corresponded to eras of "thaw" and "stagnation". And, "severe" A. Kovalyov sees presence of intonations of a certain neglect and condemnation in the assessment of creativity. Thus, Kovalyov kind of at all rejects all importance of experience and heritage of men of the sixties, is groundless criticizing "severe realism" as the phenomenon of art culture. Such radical statement quite keeps within modern tendentious statements of young art critics that the quality of painting in general is not so important that just and lays down on modern fashionable concepts of vision of the fine arts. However, never-

theless recently more often there are serious works which authors consider the various thematic directions in creativity of masters of "severe style". So, for example, the master's thesis of L.K. Bondarenko "A village subject in works of the Soviet painters of the 1960-1970th years" was devoted to detailed study "rural" subject in creativity of "severe". In a number of the modern researches concerning painting of masters of "severe style" the emphasis on direct influence of masters of the Russian vanguard, for example the known community "Jack of Diamonds" is persistently placed. And, researchers especially note influence of painting of Robert Falk, Aristarkh Lentulov, Alexander Kuprin, Alexander Osmyorkin, Ilya Mashkov, Pyotr Konchalovsky. Some art critics pay attention to that fact that influence of these artists was shown in the form of original independent experiments without being simple imitation or loan of others artistic touches on own cloths "severe".

Conclusions

Growth of number of special publications 1990 - 2000 - x the investigating a phenomenon of "severe style" the certificate of quite fixed and serious analysis of this phenomenon of the Soviet art in comparison with the previous decade of interesting searches of men of the seventies - the eight-foremen who for a while "removed" studying original creativity "severe". Authors of these numerous publications bring everyone in own way something new in understanding of that direction. Expressing individual opinions and giving the estimates, authors of publications, undoubtedly, enrich understanding of both formal, and substantial characteristics of this unique phenomenon of domestic art. Despite diversity of "severe", it is possible to reveal the certain general signs uniting creativity of various masters and relatives on mood of a cloth, perceiving them as the uniform direction. Therefore, first of all, the ideological and art programs of "severe style" setting a vector of the movement from a publicistic expression in its early period to religious philosophically art judgment of problems of life in the next decades have to become a subject of a serious art criticism research.

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PSYCHOLOGICAL AND LEGAL ISSUES IN CLINICAL MEDICINE FROM THE PERSPECTIVE OF THE EPISTEMOLOGY METHODOLOGY

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Introduction. The online book, "Force Majeure in Surgery", published with an international book brand - LAP LAMBERT Academic Publishing (Germany), 2018, attracted the interest of even those people far from medicine, not because it contains interesting observations from medical practice, but there are other relevant issues intertwined with another problem of human activity.

This article provides observations that raise topical issues of jurisprudence extracted in a tangle of causal relationship with medical practice. Problems are examined through the prism of the epistemology methodology. Russian-language literature does not have similar information.

Keywords: Force majeure in surgery, situational diagnostics, epistemology methodology, legal issues

Unprofessional intervention by high authorities

A girl, 14 years old, was delivered to the surgical department at 23 hours. An hour and a half ago, dancing barefoot on the carpet, I felt a stitching pain in the foot. On the roentgenogram between 1 and 2 metatarsal bones of the right foot, a shadow of the gramophone needle was found.

The surgical team was busy performing emergency abdominal operations, and the responsible surgeon decided to hospitalize the patient and operate on her in the morning under fluoroscopic control.

At 3 a.m. a telephone rang. The secretary of the regional committee, who turned out to be a friend of the girl's parents, demanded that the operation be performed immediately.

The surgeon on duty, having completed the next operation, took the patient to the operating table at 5 o'clock in the morning, cut the skin over the alleged localization of the foreign body and did not find the needle. The operation was supposed to continue in the X-ray room.

Introducing the patient to the department head in the morning, the surgeon on duty turned pale and barely audibly said: "Wrong leg!" The morning shift removed the needle, and the girl was safely discharged.

A day later, the surgeon was taken to the intensive care unit with myocardial infarction. A criminal case was instituted against him, which did not reach the court, as the investigator proved that a medical error had been committed due to overwork at the 19th hour of continuous work.

The surgeon recovered, but did not return to work by profession. *The intervention of a "big boss" ended with a surgeon's myocardial infarction, followed by dismissal.*

Unwarranted insult

A woman, the wife of a high-ranking government official, treacherously went to the chief doctor of the regional hospital, he and the chief surgeon of the region, and with such indignation sets forth her complaint. She brought her daughter to the surgeon, a schoolgirl with vague complaints of abdominal pain. The daughter was examined by an experienced doctor in the admission department and an ultrasound examination for ectopic pregnancy was recommended. Then the mother threw a tantrum, insulted the doctor. How can one think of a ninth-grader and expose such nonsense. The head doctor reassured the woman, examined the girl and offered an emergency operation, which was performed. During the audit of the abdominal organs, it was established that the doctor of the admission department was right ...

References [1- 9].

On coronavirus

Fresh examples. The XXI century did not have time to begin. The world is shuddered, and is concerned about the coronavirus pandemic - 19. Yes, history knows what a pandemic of the viral-infectious etiology of microorganisms is, which claimed the lives of hundreds of thousands of

people. In the present, no one knew the slumbering famous COVID -19 would take such a turn. People are shocked because there is no effective treatment for this infection. How to survive? Doctors realized that individual self-isolation from crowding, avoiding contact, elementary wearing an individual protective mask, as well as observing other burdensome protective measures, it is quite possible to protect yourself and loved ones. Throughout the world, starting with the head of state and physicians daily, if not hourly, by the accessible media, the population was informed of the dynamics and statistics of the disease. Unfortunately, simple safety measures were not observed, despite the intensive and convincingly clear warning of specialists. Accordingly, the results became very deplorable. For clarity, I give examples. In one and the other cases, in the family of two officials of a rather high rank they had a party and from where they got the disease. The source was the wives of officials who traveled to countries where the outbreak had just begun. Family members knew about this information, in honor of the pilgrimage of holy places they invited guests. What a luxury. Such a stupid trend exists in our area. As a result, some of the invited guests of the officials became infected. The most important thing at the initiative of their husbands-chairmen hid what is happening. Treated secretly. Fortunately, the outbreak was somehow eliminated by the efforts of physicians. Here is the other side of the coin of respected elites.

Conclusion

In the end, I do not make my own conclusions about the officials, I do not dare, but I conceal them. I give some references to this topic from published works in the media. ... In one author's article it is noted, "... today, it can be said with confidence that 80% of the country's population has deep disrespect for the authorities. The ridiculous laws and restrictions for the entire population of the country have already become the norm and it is very difficult to change this order of things. TV channel **Top-life writes:** For officials, there are no laws: in this regard, they can do everything that comes to their mind! Laws are for the people. Next: ... what is the basis for going to court with a Statement (Complaint) about a violation of a citizen's rights and freedoms ... for this it is *enough* that an OPINION (?) about a violation of his rights appears in the applicant's head. It would seem paradoxical! But this is exactly what is written in part 1 of art. 254 Code of Civil Procedure of the Russian Federation.

A simple sacramental question of a moral nature is being asked! And what kind of experiences do the doctors participating in the bacchanalia

of the chairmans sometimes suffer, where their family members are even actively involved !? We are thinking of resolving the rhetorical question, but when, and how? Consequently, connecting the humanities, as we have applied in our work, change the methodology in solving the problem.

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AUTOANTIBODIES IN CHILDREN WITH HEMATOGENOUS OSTEOMYELITIS

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The aim of this study was to determine the spectrum of organ-specific autoantibodies and the frequency of their detection in acute and chronic hematogenous osteomyelitis. 74 children with hematogenous osteomyelitis were examined. A simultaneous increase in the level of various autoantibodies was associated with an unfavorable course of the disease (sluggish inflammatory process, the formation of purulent fistulas, pathological fractures in the long term, transition to a chronic form in acute hematogenous osteomyelitis). Probably, in such cases, more active treatment tactics and longer monitoring of the patient are required.

Keywords: hemolytic-uremic syndrome, adhesion molecules, sICAM-1, sVCAM-1

Introduction

One of the cornerstones of immunology is the phenomenon of auto-tolerance and auto-aggression. In those cases when a breakdown of the mechanisms of self-tolerance occurs, an immune response develops against "one's own", and the key role in this process is assigned to autoantibodies, which can be fixed on the cells and cause their damage. However, the detection of autoantibodies is not always associated with any particular autoimmune disease. And since the time of P. Ehrlich and A.M., disputes are often held about whether the presence of autoantibodies is a pathology or the norm.

Over the past decade, the understanding of the biological role of autoantibodies has significantly expanded and expanded. So, it was found that they play an important transport role, participating in the clearance of DNA degradation products that occur during inflammation, necrosis, apoptosis; they regulate inflammatory reactions, limiting the production of pro-inflammatory cytokines, proliferation and repair processes, some autoantibodies have catalytic functions, that is, they are also enzymes. Finally, according to some authors, autoantibodies can be attributed to

the first line of defense against microorganisms, along with such factors of innate immunity as lysozyme, lactoferrin, secretory immunoglobulin A, complement, etc. [2].

Despite the fact that the phenomenon of autoreactivity is described in many pathological conditions and there is a huge amount of experimental and clinical data demonstrating the possibility of developing an autoimmune pathology in one or another infectious process [3-7], it can be stated that still insufficient attention is paid to monitoring the level of these autoantibodies and determining their prognostic value in various pathological conditions. At the same time, determining the level of autoantibodies may turn out, along with such well-known immunological indicators as markers of the cell surface of lymphocytes, the level of the main classes of immunoglobulins, complement, characteristics of phagocytosis, an important laboratory criterion that allows optimizing the management of patients with various somatic pathologies [8-10].

In pediatric surgery, one of the most common types of acute surgical infection is acute hematogenous osteomyelitis, which is often characterized by a severe course, a tendency to chronic inflammatory process and a rather high frequency of adverse outcomes (pathological fractures, false joints, shortening and deformation of limbs) An equally urgent problem there is a problem of chronic osteomyelitis, in the treatment of which unsatisfactory results are noted in 8-20% of cases [1].

Based on the foregoing, it was suggested that autoimmune mechanisms can participate in the pathogenesis of hematogenous osteomyelitis and be one of the factors contributing to the transition of the disease into a chronic form. The aim of this study was to study the spectrum of organ-specific autoantibodies and the frequency of their detection in acute and chronic hematogenous osteomyelitis.

Patients and methods

The content of antibodies to double-stranded DNA, antinuclear antibodies (ANA), total antiphospholipid antibodies (APS) of classes M and G, antineutrophil autoantibodies (ANCA), which included antibodies to myeloperoxidase, proteinase-3, a bactericidal protein that increases permeability (BPI), elastase, cathepsin G, lysozyme and lactoferrin was determined in serum of patients with hematogenous osteomyelitis by ELISA.

Results

We examined 74 children with hematogenous osteomyelitis from the age of 4 months. up to 15 years, including 52 with acute hematogenous osteomyelitis (AHO) and 22 with chronic hematogenous osteomyelitis (CHO). (tabl.1).

Table 1. Autoantibody detection rate for hematogenous osteomyelitis

Criteria	AHO (n=52)	CHO (n=22)	Total (n=74)
Anti-DNA	11(21%)	12 (54%)	23 (31%)
APS	4 (7,7%)	3 (12,5%)	7 (9,5%)
ANCA	26 (50%)	6 (27%)	32 (43,7%)
ANA	1 (1,9%)	-	1 (1,3%)

A normal level of autoantibodies was observed in 21 (40.4%) patients with AHOs and only in 6 (27.7%) CHOs.

With AHO, in most cases, the increase in antibodies to double-stranded DNA was negligible (21-30 U / ml). If the initial level was higher (30-40 U ml), the course of the disease was more severe or prolonged, although the outcomes were favorable. At higher values of this indicator, and especially, with an increase in the level of these autoantibodies in the dynamics, the disease took a chronic course, pathological fractures formed. In most patients with favorable outcomes, as the pathological process regressed, the level of autoantibodies to double-stranded DNA decreased.

In CHO, an increased level of antibodies to double-stranded DNA was found much more often (in almost every second patient), and in 36% it exceeded 40 U/ml. Normalization of this indicator was associated with clinical remission.

The increased content of ANCA, on the contrary, was much more often recorded in AHOs (50%). In most cases, antibodies to elastase (26.7%) and to BPI (20.2%) were increased.

A simultaneous increase in the level of various autoantibodies was associated with an unfavorable course of the disease (sluggish inflammatory process, the formation of purulent fistulas, pathological fractures in the long term).

Conclusion

According to the data obtained, in both acute and chronic hematogenous osteomyelitis, a significant proportion of patients have an increased content of antibodies to double-stranded DNA and antineutrophilic antibodies (mainly antibodies to BPI and elastase), and their level, especially in dynamics, usually correlates with activity pathological process.

Apparently, the excessive formation of these autoantibodies associated with the processes of inflammation and apoptosis is a marker of the adverse course of hematogenous osteomyelitis (the development of pathological fractures and the transition to a chronic form in acute hematogenous osteomyelitis, a torpid course in chronic hematogenous osteomyelitis). In such cases, more active treatment tactics and longer monitoring of the patient are required.

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CONVERSION OSTEOSYNTHESIS IN THE TREATMENT OF INTRA- AND PERIARTICULAR FRACTURES OF THE LOWER THIRD OF THE FEMUR IN PATIENTS WITH POLYTRAUMA

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Introduction. *The treatment of patients with femoral fractures is of particular relevance in modern traumatology, especially in patients with polytrauma. The treatment of such fractures is complicated by the fact that it depends not only on the nature of the fracture, but also on the general condition of the patient. Such fractures caused by high-energy trauma are usually comminuted or fragmented and are often accompanied by neurovascular complications, especially in the distal region. Such fractures are often accompanied by soft tissue damage.*

The purpose of the work was *to improve the results of treatment of intra- and periarticular fractures of the distal femur in patients with polytrauma.*

Materials and methods. *A prospective analysis of the use of conversion osteosynthesis in the treatment of 72 patients with intra- and periarticular fractures of the lower third of the femur against polytrauma according to the ISS 17-40 severity rating scale in a multidisciplinary hospital was performed.*

Results. *The optimal time for conversion osteosynthesis in patients with polytrauma was 5-7 days, which prevented the occurrence of traumatic shock, inflammatory complications in the postoperative period.*

Conclusions. *The study confirmed the feasibility of conversion osteosynthesis in the treatment of patients with intra- and periarticular fractures of the lower third of the femur. The use of the technique of transferring fixation of fragments by an external fixation apparatus to internal osteosynthesis (conversion) contributed to a reduction in the time of inpatient treatment of patients with fractures of long bones.*

Keywords: *damage control, femoral fractures, external fixation devices, osteosynthesis, polytrauma, distal part of the femur.*

Conflict of interest: *not declared*

Source of financing: *study conducted without sponsorship*

Introduction

According to statistics, the incidence of fractures of the lower extremities reaches 19% of cases, while the upper limbs are affected in 17.7% of cases [1,2]. The presence of lower limb fractures in patients with polytrauma worsens the prognosis and increases the risk of complications. Patients with fractures in the distal femur often have a poor prognosis in terms of functional recovery [3,4]. The treatment of such fractures in patients with polytrauma is of particular relevance at all stages of treatment, since these fractures are associated with serious complications and poor functional results.

By the mechanism of occurrence of these fractures, this is either a high-energy injury in young patients aged about 30 years, or a low-energy injury in elderly people, most often women over 70 years old. [4,10] The first group of such fractures is associated with traffic accidents or extreme sports, that is, high-energy injuries, and fractures of the second group are usually caused by accidents at home, that is, low-energy injuries. Nevertheless, polytrauma affecting older patients is becoming more common, and the average age of these patients is currently ten times higher than 30 years ago [9].

An important point in such fractures is a careful assessment of the vascular and neurological status, as well as the limbs and condition of the surrounding soft tissues, since these fractures are often accompanied by damage to the neurovascular bundles and extensive damage to the soft tissues. According to many authors, treatment should be aimed at achieving a balance between primary and final stabilization of the damaged segment, while avoiding potentially life-threatening systemic complications, such as fat embolism, respiratory distress syndrome and multiple organ failure [11]. Therefore, the correct tactics of treating patients with polytrauma by the principle of “damage control” is very important [3,4,6]. Damage control of these fractures should be planned carefully so as not to impede subsequent final osteosynthesis (conversion). This issue remains relevant to date and requires further study.

The purpose of the work was improving the results of treating fractures of the distal femur in patients with polytrauma, analyzing the experience of treating patients with intra- and periarticular fractures of the lower third of the femur with polytrauma, determining the features of providing them with trauma care at all stages of hospital treatment, and examining options and terms conversion to internal osteosynthesis.

Materials and methods

This study was conducted on the basis of the Department of Traumatology and Orthopedics of the Peoples' Friendship University of Russia - the Department of Traumatology and Orthopedics of the City Clinical Hospital named after A.K. Eramishantsev from 2016 to 2019. We observed 72 patients with polytrauma according to the ISS 17-40 severity rating scale, which included a distal femur fracture, which underwent surgical treatment. In most cases, the severity of the condition was due to a traumatic brain injury and multiple pelvic fractures; in some cases, the severity of the condition was due to fractures of the spine, ribs, as well as ruptures of the liver and spleen. In this case, fractures of long bones of the limb in most cases, were of a multiple nature. Of these, men - 62.5% (n = 45), women - 37.5% (n = 27). The median age at the time of surgery was 42.1 (26-78) years. The average observation duration was 12.3 months.

The tactics and method of surgical treatment were determined on the basis of the type of fracture according to the AO classification, in which extra-articular, partial intraarticular, intercondylar and complete intraarticular fractures are distinguished [6]. Fractures in patients with polytrauma are the most complex, while the most common types of femoral fractures are A3, as well as C2 and C3. C3 fractures are the most difficult to manage, due to complex metaphyseal and intraarticular fractures. The degree of elongation directly depends on the energy that caused the fracture and

the quality of the patient's bone tissue. These fractures are often accompanied by damage to the soft tissues, blood vessels and nerves, as well as damage to the musculo-ligamentous apparatus, and often these are open fractures. In the preoperative period, laboratory diagnostics, X-ray of the chest, thigh, and knee joints in standard projections, ECG, consultation with a therapist, as well as CT of the knee joint were performed. All patients, when enrolled as antishock therapy in combination with local anesthesia and infusion therapy, underwent emergency surgery in the amount of mounting the external fixation apparatus on the damaged segment in the early stages, without striving to achieve an ideal correlation of fragments. This approach provided the opportunity for effective care and monitoring of victims in order to prevent the development of traumatic shock in patients, fat embolism and venous thrombosis of the damaged segment, as well as secondary damage to the main vessels and nerves.

An important point in the initial stabilization of the fracture in the apparatus was careful handling of the soft tissues of the segment, and the localization, level and nature of the fracture were also taken into account. When installing the apparatus, the lower leg bones were also fixed in order to strengthen the degree of fixation of the damaged segment. In three cases, during the initial stabilization of the fracture, the installation of the external fixation device of the CVC was performed..

After the general condition improved within 5-7 days, the second stage was the conversion of these patients to final immersion osteosynthesis with blocked rods or plates depending on the nature and location of the fractures. The presence of implants in the hospital and the possibility of their acquisition by patients, if necessary, were also taken into account.

The basis for the transition (conversion) from extrafocal to submersed osteosynthesis was: hemoglobin more than 90 g/l; hemotacrit more than 35; finding a patient without mechanical ventilation for more than a day without dopamine (vasopressors); blood pressure stabilization of more than 90 mmHg for at least a day of observation; adequate diuresis for at least a day; stable indicators of blood saturation for at least a day of observation; lack of acidosis; the absence of signs of inflammation of the wound area of the limb, if any.

All patients received treatment according to the standard management protocol for postoperative patients. In the postoperative period, X-ray of the femur and knee joint was performed in standard projections on the second day after the operation, at 3, 6, 12 months, then annually at follow-up examinations.

As can be seen from the table, the most frequent injuries in patients were fractures of type A2 (16.7%), C2 (22.2%), C3 25%

Table №1. Distribution of patients by fracture location and conversion time.

Type of fracture according to AO classification	Fracture description	Number of cases		EBF lay-out	Conversion time, days	Type of submersed osteosynthesis
		Abs.	%			
33A1	Simple extraarticular fracture	6	8,3	Hip-shin	5-6	Pins
33A2	Metaphyseal extraarticular fracture with a wedge	12	16,7	Hip-shin	5-6	Pins
33A3	Metaphyseal complex extraarticular fracture	4	5,5	Hip-shin	5-6	Plates with screws
33B1	Incomplete intraarticular fracture of the external condyle	3	4,2	Hip-shin	5-7	Plates with screws
33B2	Incomplete intraarticular fracture of the internal condyle	2	2,7	Hip-shin	3-7	Plates with screws
33B3	Frontal condyle cleavage	1	1,4	Hip-shin	5-7	Plates with screws
33C1	Simple intraarticular, simple metaphyseal fracture	10	14	Hip-shin	6-7	Plates with screws
33C2	Simple intraarticular, comminuted metaphyseal fracture	16	22,2	Hip-shin	6-7	Plates with screws
33C3	Cellular intraarticular fracture	18	25	Hip-shin	6-7	Plates with screws

Total		72	100		5-7	
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Results.

Evaluation of the treatment of fractures of the distal femur was performed according to the KSS scale. Excellent results were obtained in 29 patients (40%), good - in 27 patients (37.8%), satisfactory - in 13 patients (17.8%), and unsatisfactory - in 3 patients (4.4%). Unsatisfactory treatment results were recorded in patients with C3 type according to AO, i.e., with severe fractures of the femoral condyles, which significantly complicated the performance of anatomical reposition and restoration of the integrity of the articular facet of the femur, which made the rehabilitation process difficult due to the incomplete development of movements in the knee joint. Complications in the postoperative period were not observed.

We give a clinical observation.

1. Patient M., 33 years old, after a car accident, entered the City Clinical Hospital named after A.K. Eramishantseva (CCH № 20) with a diagnosis of TST. Closed comminuted fracture of the lower third of the right femur with displacement of fragments AO:33C2. Bruise of the right half of the chest (Fig. 1).



Fig. 1. X-ray of a patient M. 33 years old with a closed comminuted fracture of the lower third of the right femur with the displacement of fragments AO:33C2.

The condition of the patient is moderate. BP 115/75 mmHg, HR 74 beats per min. Upon arrival to the admission department, they immediate-

ly performed examinations, systemic anesthesia and anti-shock therapy, and also imposed a posterior plaster cast to prevent damage to blood vessels and nerves. An hour after admission, they urgently completed the installation of a rod apparatus for external fixation (Hip-shin layout). A satisfactory position of the fragments was simultaneously achieved intraoperatively (Fig. 2). The duration of application of the external fixation apparatus was 12 minutes.

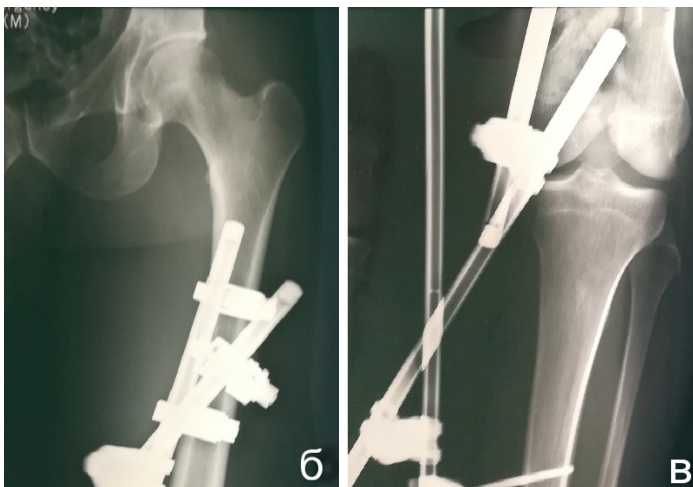
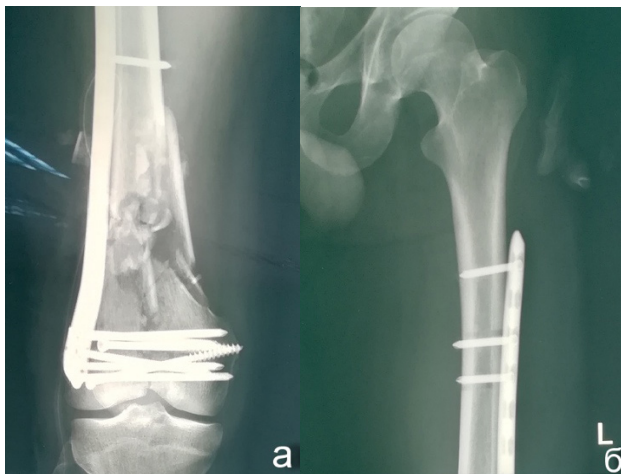




Fig. 2(a,b,c,d). Patient M. Radiographs and appearance after fixation of a fracture of the femur in the external fixation apparatus.

On the 5th day after the edema subsided, the second stage of sequential osteosynthesis was performed: dismantling of the external fixation apparatus and intramedullary osteosynthesis with a plate with screws (Fig. 3).



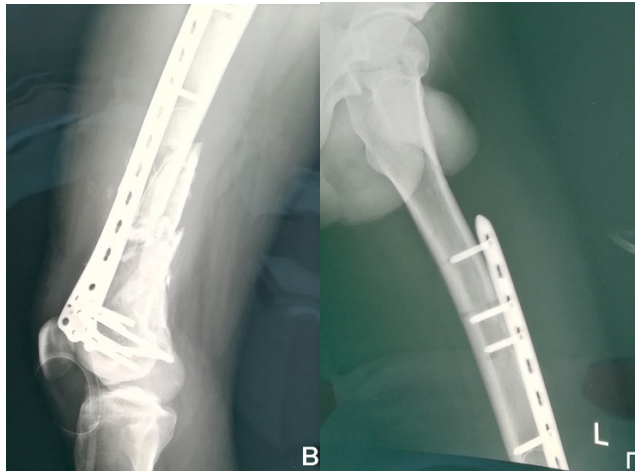


Fig. 3(a,b,c,d). Patient M. Radiographs after bone osteosynthesis with plates and screws.

The postoperative period was favorable. The next day after the operation, the patient was activated, moved with additional support on crutches. The wounds healed by primary intention.

On control examinations on radiographs, an indirect fracture fusion was observed according to the type of bone callus formation.

Discussion.

An adequate choice of tactics, methods and terms of treatment of patients with fractures of long bones, especially with polytrauma, is still an urgent issue for a positive outcome of treatment of patients [4,5,13].

According to Perron A. et al. final osteosynthesis in the early period of polytrauma (the first three days) led to death, especially with significant thoracic, abdominal and craniocerebral injuries [13]. In this case, the victims died in the first hours after the injury during these operations or on the 5-7th day from the developed serious complications: adult respiratory distress syndrome, multiple organ failure, pneumonia, sepsis [8].

However, long-term treatment of victims in the external fixation apparatus until the second stage of the operation, or as the final method of treating patients with fractures of long bones, increases the risk of infectious and hypostatic complications, as well as great inconvenience during long periods of treatment [12].

Analyzing our observations, we came to the conclusion that conversion osteosynthesis is the optimal method for treating patients with intra- and periarticular fractures of the lower third of the femur, especially with

polytrauma. Conversion (transition) of extrafocal external fixation to internal osteosynthesis in patients with polytrauma is possible within 5-7 days without the threat of traumatic shock and inflammatory complications in the postoperative period. Stabilization of the fracture in the external fixation apparatus upon admission to the hospital on days 5-7 significantly contributed to the reduction of edema and prevented the occurrence of pressure sores and hypostatic complications. Under such conditions, the implementation of submersed osteosynthesis was accompanied by less technical difficulties, which had a positive effect on reducing the duration of the final osteosynthesis, reducing the number of intra- and postoperative complications.

Thus, the study confirmed the feasibility of conversion osteosynthesis in the treatment of patients with intra- and periarticular fractures of the lower third of the femur. The use of a technique for transferring fixation of fragments by an external fixation apparatus to internal osteosynthesis (conversion) helped to reduce the time of inpatient treatment of patients with intra- and periarticular fractures of the lower third of the femur.

Conclusions

The technique of fixation of fractures of the lower third of the femur with external fixation rods at the first stage provides stabilization of fragments and prevention of shock and other post-traumatic complications, as well as secondary damage to blood vessels and nerves. The conversion (transition) of extrafocal external fixation to internal osteosynthesis for patients with polytrauma is preferably within 5-7 days, which prevents the occurrence of traumatic shock and inflammatory complications in patients in the postoperative period. Urgent fixation of unstable fractures by rod apparatuses leads to more rapid relief of soft tissue edema, which prevents the development of hypostatic complications and creates favorable conditions for the care and dynamic monitoring of soft tissue conditions.

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TACTICS FOR TREATING PELVIC FRACTURES IN THE ELDERLY

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Introduction: Pelvic fractures in the elderly represent a difficult problem for pelvic surgeons, in connection with which the bulk of patients are treated conservatively. **Purpose of the study:** evaluate the effectiveness of surgical and conservative treatment methods in elderly patients. **Materials and methods.** A retrospective analysis of the treatment of 32 patients with pelvic ring injuries older than 65 years was performed. There were 24 patients in the conservative treatment group, and 8 patients in the surgical treatment group. Long-term results were evaluated after 12 months, according to the SF-12v2 questionnaire and the “Timed up & go” test.

Results. Long-term results after a year in the conservative treatment group were evaluated in 19 patients (76.2 ± 6.7 years). In the conservative treatment group in 7 patients (73.5 ± 5.8 years). Annual mortality was 20.8% and 12.5%, respectively. In the conservative treatment group, 14 patients restored their previous level of activity (73.7%) and in the surgical

treatment group 6 patients (85.7%). **Conclusion.** In elderly patients with injuries of the pelvic ring, a high mortality rate remains. In our study, no reliable data were obtained on the advantage of surgical treatment methods compared to conservative treatment tactics. When opting for surgical treatment of pelvic ring injuries, it is necessary to consider the type of fracture, bone quality, comorbid background and previous level of physical activity. A multidisciplinary approach and outpatient monitoring until recovery of physical activity as an integral part of the treatment of this group of patients.

Keywords: pelvic fracture, osteoporosis, treatment, elderly patient.

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Introduction and relevance of the problem

Pelvic fractures are among the five most common among patients over 65 years of age. [1] In this age group, 73% of all pelvic fractures occur [2] and in 79% of cases they are female. [3] Injury most often occurs as a result of a fall in everyday life, patients arrive in a hemodynamically stable state with complaints of severe pain in the pelvic region. [4] As a rule, the minimum displacement of fragments is determined. [5] [6] Motor activity and self-care are significantly reduced. [7]

With age, bone strength of the pelvic ring gradually decreases, especially in the region of the lateral masses of the sacrum, where areas without trabecular bone are formed, called "sacral voids" [8]. Fractures occur in the region of the smallest bone mass [9] and can be used as clinical markers of osteoporosis. [10] The first occurrence of a low-energy fracture of the pelvic bones increases the five-year risk of fractures of other localizations by more than 30%. [11] Adverse factors affecting the occurrence of fractures, in addition to reducing bone mass, are senile asthenia, the occurrence of which is due to a decrease in the adaptive functions of the body and the destabilization of homeostasis. The clinical manifestations are weakness, a significant decrease in body weight, muscle strength and a low level of physical activity. [12]

Diagnosis of pelvic fractures against a background of low bone mass is difficult, due to the lack of awareness of orthopedists regarding the possible causes of their development and clinical manifestations. [13] Pathological fractures of the sacrum are often overlooked during routine radiography. [14] Moreover, even CT scan reveals fractures in 71-73% of cases, while MRI in 99% of cases. [15] [16] Bone edema on an MRI histologically corresponds to microfibro cancellous bone and hemorrhage in the yellow bone marrow. [17] In the absence of recovery processes, the

fracture line becomes visible on CT after 2-3 weeks. [18] However, if you avoid overloading the damaged segment and carry out therapy aimed at improving bone metabolism, the development of a fracture can be avoided. [19] Initially improper treatment tactics in combination with low bone mass and delayed consolidation can lead to further displacement of fragments, the emergence of new fracture lines and, as a consequence, the progression of instability, which occurs in 18% of cases of conservative treatment. [20] [21]

Despite the fact that low-energy fractures of the pelvic bones against the background of osteoporosis were described several decades ago [22], little is known about their course and forecasts. [21] Classically for this group of patients, conservative treatment is used, which consists of bed rest, analgesic therapy, physiotherapy and activation as much as pain syndrome allows. In the last decade, the use of submersible osteosynthesis is increasingly recommended. [23], [24] Minimally invasive surgical techniques using long bone corridors [25] [26] [27], as well as bone cement augmentation to prevent migration, have been proposed. [28] [29]

The features and difficulties of treating pelvic fractures in elderly patients prompted us to conduct a clinical study to evaluate the effectiveness of surgical and conservative treatment methods in elderly patients. It is believed that the results of surgical treatment are better with conservative therapy.

Materials and methods

We conducted a retrospective analysis of the results of treatment of 32 patients with pelvic fractures who were admitted to the City Clinical Hospital named after A.K. Eramishantseva for 2018. Patients gave written consent to participate in the study. The inclusion criteria were age over 65 years, violation of the integrity of the pelvic ring. Patients with AO / OTA A1 and A3 fractures were excluded from the study, as were the fractures associated with a violation of the integrity of the acetabulum and death at admission. Women 24 (75%) people, Men 8 (25%) people. 7 (21.8%) people with polytrauma, among them 5 men and 2 women, the average value of ISS was 22.8 ± 3.5 points. Distribution of fractures according to the AO/OTA classification A2 -2 (6.2%) B1-7 (21.9%) B2 -18 (56.3%) B3 - 4(12.5%) C1 -1(3.1%)

The first step was the diagnosis and elimination of life-threatening conditions. For screening diagnostics, an X-ray of the pelvic bones was performed, which was informative for the anterior part of the pelvic ring [30], however, the accuracy of detecting injuries of the posterior part is limited [31] and, therefore, all patients with revealed injuries of the anterior part of

the pelvic ring had a pelvic CT scan. All patients with unstable pelvic ring injuries underwent pelvic bandage stabilization as early as possible in AVF, which significantly reduced mortality in the injured. [32] However, due to the high risks of rod migration and the development of infectious complications [33], fixation in AVF was used only until the patients had stabilized. All patients underwent prophylaxis of hypostatic complications, thrombosis and embolism, and symptomatic therapy.

In the studied group of patients, conservative and surgical treatment was performed. Indications for immersion osteosynthesis were fractures of type B3 and C1, as well as the preservation of pain, which does not allow for the activation of the patient. Due to the presence of decompensated concomitant somatic pathology, after appropriate additional examination and the conclusion of relevant specialists in 5 (15.6%) cases, it was decided to refrain from immersion osteosynthesis, of which AO/OTA fractures B3-2 people B2 - 3 people B1 - 1 person.

In the conservative treatment group for fractures A2, B1, B2, activation was performed on crutches with a partial load on the damage side for 6 weeks. Then, a metered increase in load was performed as the pain was stopped from 6-12 weeks. For type B3 fractures, in the first 6 weeks activation within the bed, movement on a seated gurney were carried out. Walking with additional support from 6 to 12 weeks as the pain is relieved. An aggressive approach to rehabilitation measures is fraught with an increase in the displacement of fragments, the spread of the line of fractures and the intensification of pain. During inpatient treatment, all patients received a drug therapy for osteoporosis by a traumatologist, followed by an observation by an endocrinologist.

Non-merging was estimated in the absence of consolidation during the year.

Given the presence of cognitive changes in older patients, to objectify long-term results, we used the SF-12v2 questionnaire [34] to assess the quality of life and conducted a "Timed up & go" test [35] after 12 months. *Table 1* shows the characteristics of the compared groups of patients.

Table 1.

Parameters	Conservative treatment	Surgical treatment
Amount	24	8
Age	76.2±6.7	73.5±5.8
Sex	M5F19	M3F5
Low energy injury	20	5

High energy injury	4	3
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Results:

Annual mortality was lower in the surgical treatment group (12.5%), however, the hospitalization duration and the number of complications were lower in the conservative treatment group. A comparative analysis is shown in *table 2*

Table 2

Parameters/ Group	Conservative treatment (N24)	Surgical treatment (N8)
Bed days	9.3±4.6	16.7±3.2
Complications	5(20.8%)	2 (25%)
Annual mortality	5(20.8%)	1(12.5%)

Table 3

Fracture type/ Fixation type	Posterior section with the cannulated screw.	Posterior section with the cannulated screw + Anterior section with plate	Posterior section with the cannulated screw + Anterior section with threaded needle.
C1		1	
B1	1		
B2	2	1	1
B3		1	1

Table 3 shows the distribution of fixation methods for various types of pelvic fracture. In one patient, 6 weeks after increasing the load, the cannulated screw migrated. The screw is removed, activation is continued with a metered load of up to 12 weeks. On control radiographs, fracture consolidation is determined in a year. Long-term results after a year in the conservative treatment group were evaluated in 19 patients. A comparative assessment of the long-term results of treatment of both groups of patients is presented in *table 4*. In the conservative treatment group in 7 patients. In all cases, this is due to the death of patients.

Table 4

Parameters/Group	Conservative treatment (N19)	Surgical treatment (N7)
Non-merging	2 (10.5%)	0
"Timed up & go" test	12.6±1.8 s (10-18s)	12.4±1.3 s (10-16s)

SF-12v2	Satisfied -16 Not satisfied - 3	Satisfied 7 Not satisfied -1
Returned to previous activity level	14 (73.7%)	6 (85.7%)

Clinical case

Fixation of the sacrum with a cannulated screw allows you to safely perform early activation of the patient and relieve pain. Clinical example. Patient R., 68 years old, injury as a result of a car accident, passenger. Delivered by a team of ambulanc). The diagnosis was established: "Poly-trauma. Fracture of the lateral sacrum masses on the right Denis I. Fracture of the ischium on the right with displacement of fragments. AO/OTA 61-B2.1 Fracture of the transverse processes on the left L3, L4, L5. (**Fig.1**)

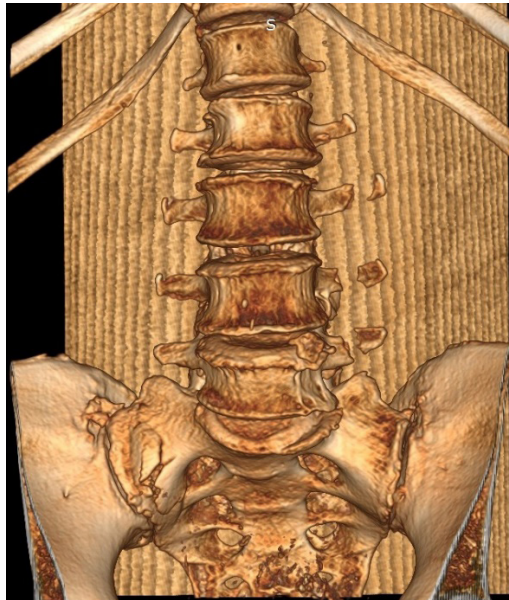


Figure 1. Computed tomogram, 3D reconstruction, visualized fracture of the transverse processes on the left L3, L4, L5. Fracture of the lateral sacrum masses on the right Denis I.

Closed fracture of the distal metaepiphysis of both bones of the right forearm with displacement of fragments. Chest injury. ISS -21 point

After stabilization of the patient's condition, an attempt was made to activate. Due to the presence of an ipsilateral fracture of the upper limb

and severe pain in the lumbosacral region, fixation of the sacrum to the right with a 7.0 mm cannulated screw was performed simultaneously on the 3rd day. Osteosynthesis of the bones of the forearm with plates and screws. The patient is activated on the first day after surgery. The post-operative period without complications. On the control radiographs, after a year, consolidated fractures of the lateral masses of the sacrum to the right and the ischium to the right are determined.

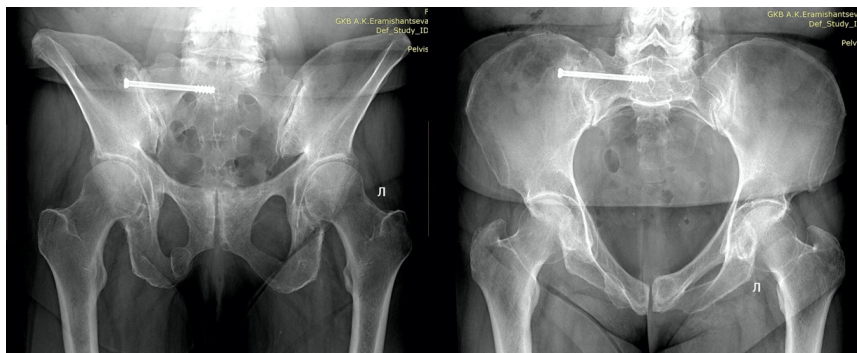


Figure 2 Radiography of a consolidated fracture of the lateral sacrum mass on the right one year after surgery. Osteosynthesis by cannulated screw. Consolidated fracture of the ischium on the right. A. Projection exit from the pelvis. B Projection entrance to the pelvis.

Long-term results after 12 months. **(figure 3)** "Timed up & go" test results - 9 seconds.



Figure 3 (A, B, C) Appearance and function one year after the operation.

Low-energy fractures of the anterior pelvic ring, without significant displacement of fragments, are subject to conservative treatment. Clinical example. Patient L. 70 years. Injury from falling from own height. Sought medical help the day after the injury in connection with the increase in pain. A fracture of the pubic and sciatic bones on the left with a displacement of

fragments was revealed. Against the background of symptomatic therapy, the prevention of thromboembolic complications, the patient is activated with additional support, a dosed load on the left lower limb. Discharged on the 3rd day. On control radiographs, after a year, a consolidated fracture of the pubic bone, a false joint of the ischial branch is determined.

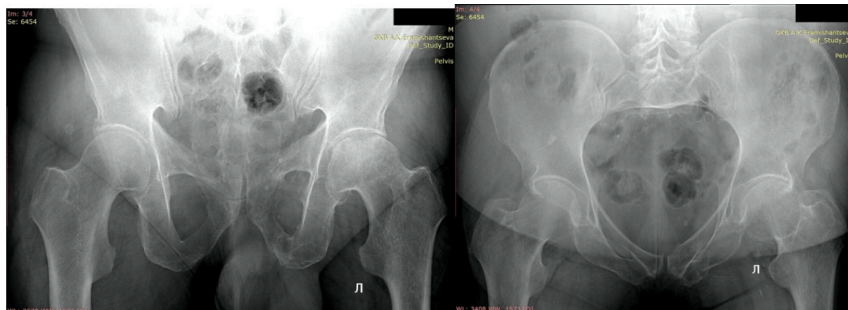


Figure 4. Control radiographs of consolidated fracture of the pubic bone, pseudoarthrosis of the sciatic branch. A. Projection exit from the pelvis. B Projection entrance to the pelvis.

Long-term results after 12 months of “Timed up & go” test - 11 seconds.
Uses a cane when walking for more than an hour.





Figure 5 (A, B, C) Appearance and function one year after the injury.
Discussion:

The main goal of treating elderly patients with pelvic ring damage is to provide conditions for early activation in order to prevent hypostatic complications, to combat pain and senile dementia. However, at the moment, after establishing the correct diagnosis, the question remains open about the need to fix these fractures using known methods of internal or external fixation. One of the main problems is the choice between the risks of surgical treatment and its advantages in the form of stabilization of the pelvic ring and the possibilities of early activation.

Domestic authors report that minimally invasive fixation, activation and early rehabilitation allowed them to significantly reduce the number of complications and mortality. [36]

The early use of therapeutic exercises in combination with mechanotherapy and electromyostimulation allows you to stop the pain syndrome and creates conditions for early activation of patients with unstable pelvic ring injuries. [37] According to Höch, complications occurred in the surgical treatment group in 18% of cases, but despite this, the two-year survival rate was 82%. Whereas in the conservative treatment group an encouraging 8% of cases of complications, but a disappointing survival rate of only 61%. [38] We have not obtained reliable data indicating the benefits of surgical treatment, and therefore we recommend that we carefully

consider the choice of tactics for treating patients with pelvic ring injuries.

According to Kanakaris and co-authors, due to the fact that the bulk of fractures is considered mechanically stable, it is proposed to use a limited number of fixation techniques in conditions of a pink bone, aggravated somatic status of patients and an insufficient number of qualified surgeons in most cases, a conservative treatment method is preferred. [39] Rollmann et al. argued that type B fractures with stable hemodynamics, the possibility of early activation and adequate pain relief should be treated conservatively, and type C fractures have the highest mortality rate and require surgical intervention [40], which corresponds to the currently accepted treatment tactics. The question remains of the optimal choice of instrumental examination of patients with low-energy damage to the pelvic ring. A review of the literature and analysis of clinical data suggest that prior to the appearance of CT in the routine examination of patients, some of the pelvic fractures in elderly patients remained undetected. Given that MRI is not always available, the study takes a long time and is expensive, it is unlikely that it can be used as a screening method. However, in patients with osteoporosis, an episode of even a minor history of trauma and the presence of pain in the sacral region of an MRI scan, the study is necessary to detect hidden injuries. Promising in the field of prophylactic screening is the detection of changes in laboratory blood parameters associated with pelvic fractures. So, in every fifth patient with pelvic fractures, an increase in blood level of osteo-associated Ca and Mg is recorded, in 9% of the examined patients — P, in 37% — the hormone osteocalcin and in 57% — the activity of alkaline phosphatase. [41] The disadvantages of the study are the retrospective nature of data collection, a small sample of patients and a relatively short observation period.

Conclusions:

The decision on the final fixation of the pelvis should take into account the nature of the fracture, the degree of its stability, the level of patient activity before and after the injury, the degree of compensation of the general condition, the severity of osteoporosis.

The type of fixation should take into account the risk of fixation failure taking into account the degree of osteoporosis, but allow early activation, and therefore we do not recommend performing external pelvic fixation as the final method of stabilization in elderly patients with osteoporosis. Preference should be given to minimally invasive methods of internal fixation.

Elderly patients with fractures of the pelvic bones should undergo postoperative rehabilitation in specialized hospitals and be accompanied by outpatient monitoring, at least until the pain disappears and motor ac-

tivity is restored. Also include complex therapy of osteoporosis and therapist's observation to compensate for premorbid background.

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PSYCHOLOGICAL CORRECTION AND REHABILITATION OF PATIENTS AFTER ISCHEMIC STROKE

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In our clinical study, we look at a multidisciplinary approach, specifically more psychological correction and rehabilitation in the recovery treatment of patients with cognitive, motor impairment following ischemic stroke. Individual routes of restorative treatment, psychological support in the restoration of cognitive impairment have been developed. The study took 50 patients with the consequences of ischemic stroke in an inpatient setting.

Keywords: ischemic stroke, cognitive impairment, multidisciplinary approach, psychological correction, positive compliance, hypnotherapy.

In recent years, we have seen a significant increase in the number of diseases with cerebral stroke, which in principle leads to the actualization of effective rehabilitation and treatment of post-stroke patients. In classical medicine, there is a rather narrow range of rehabilitation measures, but we are advocates of a multidisciplinary approach. In turn, which significantly expands the boundaries and possibilities of psychological correction, rehabilitation, as well as the restoration of socio-communicative mechanisms of interaction in society, professional competencies, that is, the patient's return to feasible work, its adaptation and smoothing of various manifestations of a depressive nature [5; 6].

Cognitive and psychological impairment occurring after a stroke is often accompanied by depressive and neurotic responses to the disease, which greatly exacerbates the dynamics of pharmacological treatment, as well as making it difficult to form a positive attitude towards therapy in general. Therefore, we aim to create positive compliance, as well as to create an active position in joint restoration with specialists of the multidisciplinary brigade [1; 2].

Thus, in our opinion, psychological correction and assistance in the rehabilitation of patients after ischemic stroke, contributes to the creation of an active, focused personal position to overcome the defective changes resulting from ischemic stroke.

We conducted our study in the inpatient conditions of the Bocharovskaya RB OGBUZ, where 50 patients who suffered ischemic stroke in the recovery period participated. These patients were treated during the recovery period as part of a multidisciplinary approach. The system of psychological support includes: neuropsychological diagnosis, psychological counseling, psychological correction, psychotherapy, hypnotherapy, which in the recovery period of treatment of post-stroke patients with cognitive and motor disorders contributes to the formation of positive compliance, involvement in the medical process, creation of an optimistic therapeutic and life perspective [3].

The duration of the disease in 16 patients - from two months to one year; in 9 patients - from one year; in 25 patients - more effective restorative treatment.

Motor disorders by hemiparetic type were observed: in 11 patients - to a pronounced degree; 23 to moderate severity; in 16 patients - mildly.

Speech disorders (aphasia) were observed in 14 patients; sensory disorders (reduced visual acuity and hearing) - in 17 patients; cognitive impairment (apraxia, agnosia) - in 8 patients.

All patients received comprehensive restorative treatment, during which drug therapy, dosed LPC and physical therapy were carried out; psychological correction, ergotherapy, speech therapist.

We use the five main scales of MoCA, MMSE, FAB, Becka, Hamilton HDRS in our diagnostic work, which is quite wide range to consider various aspects of disorders and psychological abnormalities resulting from stroke. After that, we define the patient into a group by the severity of the disease and develop an individual route [4].

Diagnosis and evaluation of the patient's cognitive functions included the study of language functions, short-term and working memory, attention, abstract thinking. The Montreal Cognitive Assessment Scale (IOA) was used for this purpose. To determine the differences between the groups, non-parametric methods were used: U-test Mann-Whitney for two independent samples and Wilcoxon signed-rank test for two dependent samples. Differences between the groups compared were considered statistically significant at $p < 0.05$. Statistical analysis was performed in STATISTICA 20.0.

In the analysis of the assessment of cognitive impairment assessed by the MoCA, MMSE, FAB scales on the day of admission, no significant differences between the groups were identified. The duration of inpatient treatment was 12-14 days. Age composition of patients: 30-39 years - 1.8%, 40- 49 years - 12.7%, 50-59 years - 38.18%, 60 years and older - 47.2%. Clinical studies conducted in the 1st group - patients who took baseline treatment in combination with cortexin showed that the average results of the MoCA scales, MMSE, FAB despite the increase in post-treatment values statistically significantly remained below the norm of 26 points (Wilcoxon Z-test = 2.73; $p < 0,006$. In the second group, the averages reached normal (Wilcoxon Z-test = 4.54; $p < 0,00001$).

The results of differences in the distribution of scale values between groups of patients with different combinations of curative drugs demonstrate that the recovery rates of cognitive impairment after treatment with cyticolin and cortexin, as well as psychotherapy were carried out, hypnotherapy as a result of which statistical indicators are significantly higher than with basic treatment (U-criterion = 194.5; p -level = 0.01).

Thus, in our opinion, psychological correction in the rehabilitation period plays a rather significant role in the system of work of the multidisciplinary team. Psychological support in the rehabilitation period of patients who have undergone ischemic stroke contributes to the creation of an active personal position, the formation of a positive attitude to restorative treatment in general.

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SOCIAL AND PSYCHOLOGICAL DEVELOPMENT OF THE PERSONALITY OF RURAL SCHOOLCHILDREN

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In our study, we tried to determine the features of the socio-psychological influence on the development of the personality of students in the conditions of a modern rural school, and also carried out a certain systematization of the socio-psychological aspects of the modern village that affect the process of personal development.

Keywords: Personality development, rural schoolboy, socio-psychological phenomena, worldview, rural school, rural schoolboy.

The future of Russia directly depends on the creative concept of education today, on an effective personnel policy, on the moral core of the younger generation, which are created by simple teachers. We prepare future astronauts, actors, directors, politicians, the military, doctors, specialists in agricultural production, we know that it is most important for rural youth to see their clear life perspective, make plans, dream, choose a spouse, and these aspects imply ensuring favorable socio-economic and socio-psychological conditions. The level of functioning of the state as a whole depends on the well-being of the modern village, since the political situation in the world is unstable and various levels of sanctions make us dependent, and therefore we need to maintain energy, economic independence. The new Law of the Russian Federation "On Education" states that "education should provide an adequate world level of the gen-

eral and professional culture of society: the formation of an adequate modern level of knowledge and the level of the educational program of the picture of the world among students; the integration of the individual into national and world culture; the formation of a person and a citizen, integrated into his modern society and aimed at improving this society". Being in an innovative and modernizing state, the rural school will change and has a completely different educational and creative effect, which in our study plays an important role. Researchers on this issue study in detail the socio-economic aspects, demographic and infrastructure conditions, the constant migration of young specialists to the megacities of our country, political reforms at the municipal levels as a set of factors and mechanisms that contribute to the development of modern village. Undoubtedly, these studies are significant, but behind all the statistics of socio-political reforms we lose the philosophical, humanistic basis of rural life [3, p. 150].

These consequences of modernity change the processes of perception of real reality, as rural schoolchildren begin to acquire behaviors and worldviews similar to urban peers. At different stages of historical development, Russia was considered an agrarian state and therefore the "Russian" was always distinguished by a deeply philosophical, humanistic worldview of the baker. The internal concept and worldview of this direction allows us to respect the traditions, customs of the peoples inhabiting our country, as well as the territorial borders of neighboring countries, without taking any changes in their direction. Our mentality has always been aimed at creating being, for many centuries we have been peace-makers and carried out only liberation, peaceful intentions.

Thus, thanks to such deep traditions and customs, we are one of the leading Powers in the world. The revival and popularization of the origins of our Motherland will allow us to move to a completely different level of politics and diplomacy. Therefore, only the support of the modern village will maintain a balance between an intellectual and progressive person and a humane and creative person. The modern village favorably affects the development of humanistic and religious views.

The modern Siberian village is characterized by monotony of life, scarcity of information, stability of social norms. A limited number of behaviors, insufficient communication development leads to slowed cultural development, poverty of speech and imagination, and less general awareness. Irkutsk region is a Siberian region with its unique educational environment, which is primarily represented by a huge variety of ethnic cultures of Russians, Buryats, Tatars, Poles, Armenians, Ukrainians, Chechens, Dagestanis, Azerbaijanis. In the Bohansky district, the multi-ethnic structure

of the population is composed of Russians, Buryats, Tatars, Poles, etc., distinguished by the identity of national cultures. In our village of Bohan, a completely unique educational environment has been created, where two directions are represented (agrarian college, teacher training college), which allows rural students to learn more about the features of training, the specifics of professions [2, p. 37].

Thus, we will try to determine the main socio-psychological aspects of the development of the personality of students depending on the peculiarities of interethnic interaction and socio-cultural conditions of the Siberian village, as well as on the unique conditions of the educational space of the Bokhansky district. Considering and analyzing the socio-psychological aspects and personal characteristics of students, we came to the following conclusions: rural schoolchildren are dominated by a demonstrative type, an emotional type, an anxious-fearful type, a pedantic type. Also, as a result of conversations and observations, we can determine the most characteristic features characteristic of rural schoolchildren. Indeed, as many scientific psychologists note, rural schoolchildren are naive, impressionable, the sensory-emotional level is overestimated, they painfully experience life changes unlike urban ones, and are honest, frank and more patriotic [5, p. 65]. For our research, it is important to change the parameters of personal self-determination and develop the image of "I," choose the life path, develop professional interest in agricultural and agricultural specialties among students [4, p. 107].

Character logical traits in rural schoolchildren are a combination of individual behavior, the properties of the nervous system, and genetic factors. The individual and personal characteristics of rural schoolchildren are a special world, since they develop in close proximity to nature, go fishing from childhood, engage in field work, collect berries and mushrooms and will not do anything as urban residents for the sake of excitement or satisfying animal instincts. The humanistic worldview of most of our schoolchildren has been instilled since childhood and therefore is taken from nature according to needs, as well as higher moral and ethical values in contrast to urban peers [1, p. 132].

Thus, the socio-psychological aspects of the development of the personality of students play a rather twofold role, and therefore, if you do not control these processes, you can get a different effect, which in principle proves our assumptions. We believe that for more effective innovative work, organizational and pedagogical measures and social conditions of the modern village must be considered in a single system, take into account all the nuances that affect the process of personal development.

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STUDY OF PHASE TRANSITIONS IN THERMAL ANALYSIS FOR CONDENSED MEDIA USING THE TIME INTERVAL METHOD

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The method of time intervals for processing structured data obtained by thermal analysis of condensed matter based on a comparison of the maximum time intervals of phase transition processes is presented. The proposed method allows us to simplify the analysis and processing of data obtained as a result of a series of experiments, and to identify the composition with the largest value of the time interval of the phase transition process. To implement the proposed method, a program was developed in the Java programming language, which is a JavaDesktop-application with an intuitive graphical interface. The export of calculation results to a text and graphic file was implemented. To verify the feasibility of this method, studies were carried out on the melting of a series of samples of ice and ice-containing compositions of aqueous solutions of inorganic compounds, as a result of which specific samples of compositions with the best thermophysical properties for accumulating cold were obtained from each series.

Keywords: thermal analysis, data processing, software, temperature measurement, phase transitions.

Introduction

The use of thermal analysis methods with modern instrumental support in condensed matter physics allows obtaining objective data on processes occurring in various solids and liquids at various temperatures [1, 2].

The study of compositions for cold accumulators during the isobaric process is complicated by the lack of cyclicity of the results, which is due to the anomalous properties of water and ice [3]. To obtain the final result on the thermodynamic phases, it is necessary to process large amounts of data, which takes a long time. For this reason, the urgent task is to increase the processing speed and analysis of experimental results to identify the composition with the longest phase transition time, which has the best indicators “temperature - time” and build a graphical dependence of these parameters [4, 5].

The purpose of this work was to develop a time interval method for the thermal analysis of condensed matter, which not only simplifies the analysis, but also processes the data obtained as a result of a series of experiments with the further identification of specific samples with a maximum melting enthalpy. The application for the time sampling method was developed in the Java programming language [6]. All calculations were carried out in the TAVV 1.0 program we created.

The method was tested in the laboratory of Thermophysics of Renewable Energy of the IGRE BJIHT RAS in studies of the melting of ice and ice-containing compositions of aqueous solutions of sodium carbonate and sodium bicarbonate of different concentrations.

Experiment

During experiments with samples in plastic containers carried out on a thermal analysis apparatus for condensed matter (TAA) [7], it was found that the process of melting ice and ice-containing compositions during a phase transition is not constant in time, both when measuring several identical samples simultaneously and in a series of measurements. That is, in the measurement cycle at each subsequent iteration, the melting times of the previous and subsequent measurements do not coincide.

Figure 1 shows the melting graphs of six identical samples with ice weighing 100 grams (ambient temperature 22 °C) during a phase transition when the melting curves approach 0 °C.

From table 1 for these graphs it can be seen that the difference in time of the ice - water phase transition of these samples reaches 30 minutes or more.

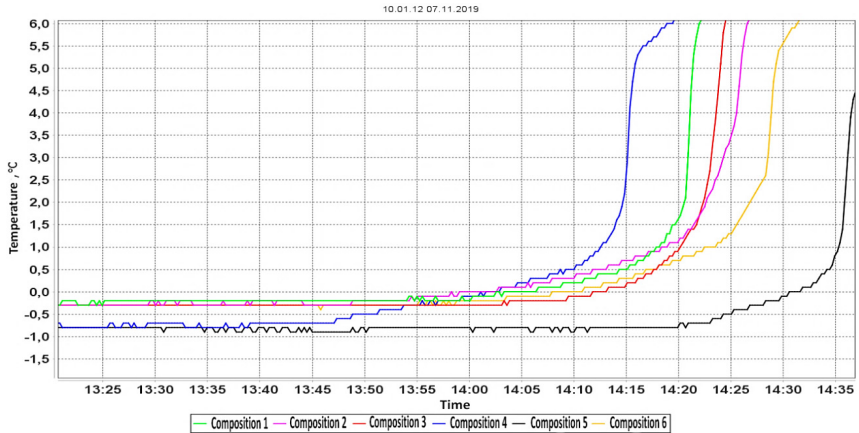


Fig. 1. Scatter in the melting time of six ice samples taken simultaneously

Table 1.

The time at which the melting curves crossed the 0 °C point during the ice-water phase transition, each of the six ice samples.

Date and time	Samples					
	1	2	3	4	5	6
13:58:18	-0.2	0.0	-0.3	-0.2	-0.8	-0.3
14:01:36	-0.1	0.0	-0.3	0.0	-0.8	-0.2
14:02:35	0.0	0.0	-0.3	0.0	-0.8	-0.2
14:07:56	0.1	0.3	-0.2	0.4	-0.9	0.0
14:11:49	0.3	0.5	0.0	0.8	-0.8	0.1
14:30:36	8.1	7.2	7.8	8.6	0.0	5.8

The time of the melting process of the composition (respectively, the enthalpy of melting) as well as the phase transition temperature is one of the main characteristics of the cold accumulator and the scatter of data on the duration of temperature storage makes it difficult to determine the most capacious composition for a battery with a long operating time. Obtaining results with a large time spread for one composition creates the problem of choosing the right temperature values when comparing two samples with each other, given that a single file with measurement data can contain more than 1000 lines. In this case, the time of the beginning and end of measurements, as well as the increment in time in several files can differ significantly.

Method description

1. Preliminary data preparation.

During a series of experiments on TAA, a directory is created in the computer's memory, and each measurement is programmatically recorded in its directory in the format:

$$\text{Dir}/\text{Sample}_N/\text{M_T}_k,$$

where Dir – general directory for program files; Sample_N – catalogs with sample name; M_T_k – catalogs with measurement files (M – sample mass, T – ambient temperature, k, N – serial numbers).

M_T_k directories contain data files, a fragment of which is shown in Table 1, for each measurement with file headers of the form Time_Data_n , where Time – the time the measurement started, Data – the measurement date, n – the serial number.

The directory tree of the program files has the form (Fig. 2)

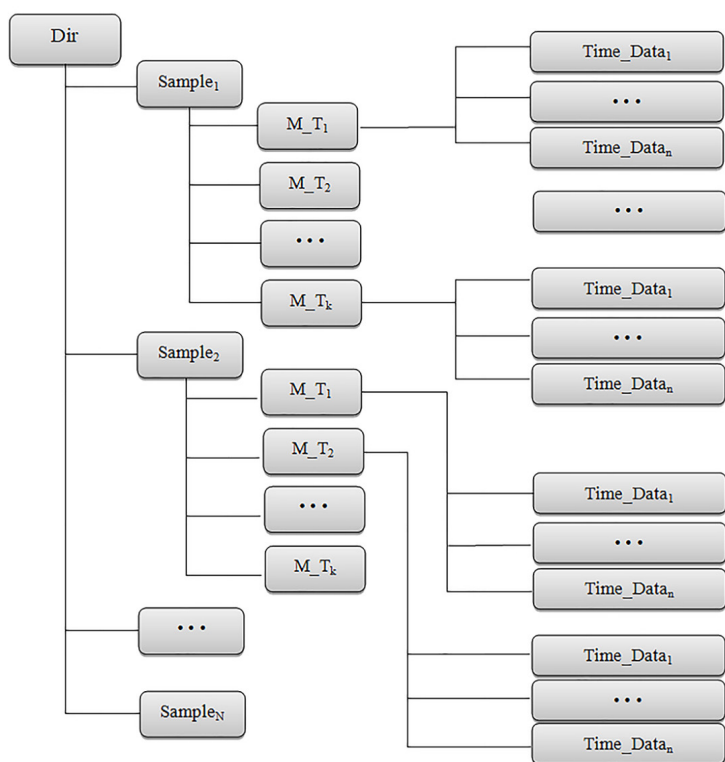


Fig. 2. TAVV 1.0 program file tree

2. Data processing

The data contained in the Time_Data_n files of the M_T_k directories in the program is divided into two arrays (Fig. 3):

1. T_i - array with time data;
 2. d_{ij} - array with sample temperatures;
- where i – number of lines in a file, j – number of samples. In this case j = 6.

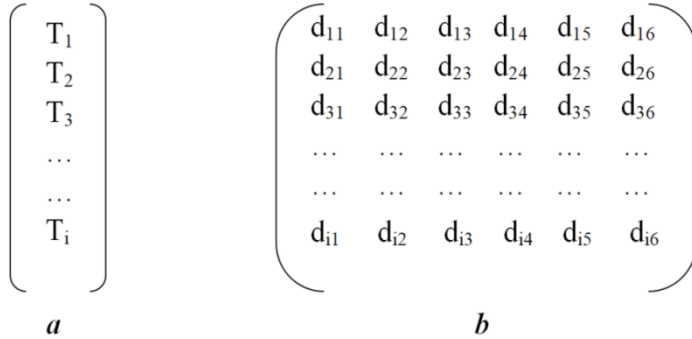


Fig. 3. General view of arrays with data. a – arrays with time, b – arrays with sample temperatures

In each file Time_Data_n of the M_T_k catalogs, in i and j enumeration cycles for each column of the d_{ij} array, there is an array element equal to t_{min} (lower range of the selected temperature) and an element equal to t_{max} (upper range of the selected temperature).

The Map (T_i, d_{ij}) interface, in Java, is a mapping (dictionary), where each element represents a "key – value" pair. In this case, the key is the time for receiving data during the measurement, and the value is the line with the temperatures of six samples of the selected composition:

Map ("14:01:36", "-0.1, 0.0, -0.3, 0.0, -0.8, -0.2")

Thus, if the elements are found, then by the value of the element d_{ij} satisfying the above condition, we obtain its key in the form of time. If no items are found, i.e. array d_{ij} is not in the range (t_{min}, t_{max}) this array is not indexed (in the case when t_{min} is less than the initial element of the array or t_{max} is greater than the final element of the array).

The time corresponding to the array element equal to t_{min} is subtracted from time to the corresponding array element equal to t_{max}, and the result is written to a new array ΔT for each column:

$$T_1 = \text{Map.get}(d_{ij_min}); T_2 = \text{Map.get}(d_{ij_max}); \Delta t_{ij} = T_2 - T_1; \Delta T = \Delta t_{ij}$$

Accordingly, the ΔT array will consist of values containing strings with time:

$$\Delta T = \{ \Delta t_1, \Delta t_2, \dots, \Delta t_6 \},$$

where $j = 6$, Δt_j - string of the form "hh:mm:ss" (hh – hours, mm – minutes, ss – seconds).

In the resulting array ΔT is the maximum time:

$$T_{\max} = \max(\Delta T).$$

After going through all the files of the M_T_k directory, we get an array of maximum MT_k times for each directory of the selected composition:

$$MT_k = \{ T_{\max_1}, T_{\max_2}, \dots, T_{\max_k} \}$$

As a result, we get an array of maximum times for each directory file M_T_k from which the largest time value is selected:

$$F_{\max_M} = \max(MT_k)$$

The final result of comparing two samples (compositions) is to compare their maximum times:

$$W = \text{compare}(\text{Sample}_1.F_{\max_1}, \text{Sample}_2.F_{\max_2}),$$

where = Sample_1 , Sample_2 – selected directories.

Also, to control the processed data, the average phase transition time of each sample in each file of each series of measurements is calculated. Below is a snippet of the output of the program to a file:

• *Directory 1: E:\MyWorkProject\ProjectTermAnaliz\DCM\DataBase\Water\100_22*

• *Directory 2: E:\MyWorkProject\ProjectTermAnaliz\DCM\DataBase\Sostav22\100_22*

Selected range: -4.0 to 4.0

Directory 1: C:\DCM_Eng\DataBase\Water\100_22\11.46.52_06.11.2019.txt,

Thermocouple: 5, Time: 4:47:1

Directory 2: C:\DCM_Eng\DataBase\Sostav22\100_22\9.56.06_24.12.2019.txt,

Thermocouple: 5, Time: 4:26:17

Directory 1 average time: 4:16:35; Directory 2 average time: 3:59:50

Result:

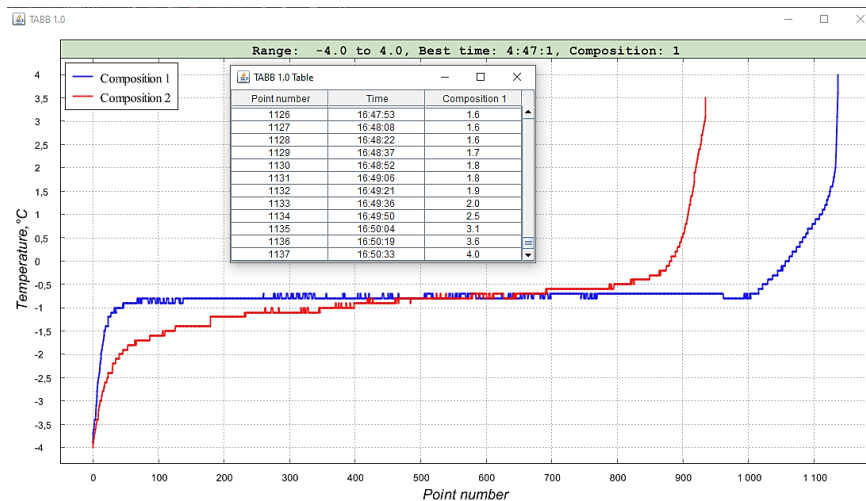
Directory 1: C:\Users\13\Desktop\DCM_Eng\DataBase\Water\100_22\11.46.52

06.11.2019.txt

Thermocouple: 5, Time: 4:47:1

The difference in phase transitions for the maximum time: 4:47:1 - 4:26:17 = 0:20:44

The output of the time interval method results for two selected samples in the form of graphs is shown in figure 4.



4. Graphs of two selected samples (compositions). 1 – sample with the best (longest) melting time, 2 – sample selected for comparison

All data obtained during processing are saved in a text file of the directory with the name of the sample (composition) under a name containing the time and date of the best melting time.

Conclusion

The proposed method allows us to simplify the analysis and processing of data obtained as a result of a series of experiments, to identify the composition with the longest phase transition time, which significantly affects the thermal energy stored by the cold battery. The calculation results for this method are saved in text and graphical form. The time sampling method can be used not only in thermal analysis, it can be used when comparing any data in which the data is dependent on time.

The application for the time interval method is written in the Java programming language (version jre 1.8) in the integrated development environment IntelliJ-Idea CommunityEdition 2019.3 [8] and is a cross-platform application. When creating graphical interfaces, the Swing [9] and XChart [10] libraries were used.

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FORMATION OF AN INTRA-COMPANY TECHNICAL SERVICE SYSTEM AT A MINING ENTERPRISE

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The article discusses the methodological approach to the reorganization of the repair service of a mining enterprise (ME) into an independent structural unit that provides technical services (mining equipment service) to the main production of a ME. The main reasons for the inefficient operation of the repair service are considered, the need for organizational transformations into one of the forms that allows the repair service to build economic relations with other departments of the enterprise on the basis of mutual benefits is substantiated. The factors that must be taken into account when reforming the organizational structure of the repair service are presented, a brief analysis of the preference of the areas of technological specialization and the structure of the main functions of the service are presented. This approach will allow company managers to make an informed choice - to give the equipment for repair to a third-party organization, or to carry out repair services on their territory on the principles of providing services and mutual benefits.

Keywords: reorganization, independent structural unit, repair service, organizational structure reform, technical service, reliability of equipment.

The article is based on many years of research by the authors of the effectiveness of the activity and structure of the repair service of mining enterprises. The accumulated experience allows us to state the following: reorienting the production of many mining enterprises (ME) to business activities in a competitive environment, increasing the importance of resources for owners of enterprises, the availability of new foreign equip-

ment and old equipment manufactured at Russian engineering plants makes ME necessitate a fundamentally different mechanism ensure the operability of mining equipment.

In competition, consumers of mining machines faced the problem of ensuring an economically feasible level of operability of mining machinery and equipment, some of which (60 - 70%) is equipment with an excess service life and no residual book value. [1]

It is becoming increasingly difficult for a mining company to provide repair service for such equipment. The increase in capital investments associated with the development of the repair and mechanical base and the warehouse of spare parts, an increase in the cost of training personnel serving mining equipment, negatively affects the cost of production. The formation of a policy in the field of using technical service methods and repair work at a mining enterprise is subjective and does not always coincide with the recommendations of the manufacturers of mining equipment and machinery, which ultimately leads to a decrease in the operability of machines, service life and a significant increase in the cost of their maintenance.

As a result of research on ME (1990-2000), it was found that the mining equipment repair system is characterized by a 3-4-fold excess of production capacities, 5-7-fold - of material and labor resources. In addition, the production time of mining equipment is 2-3 times less than the time it was in work. (fig. 1)

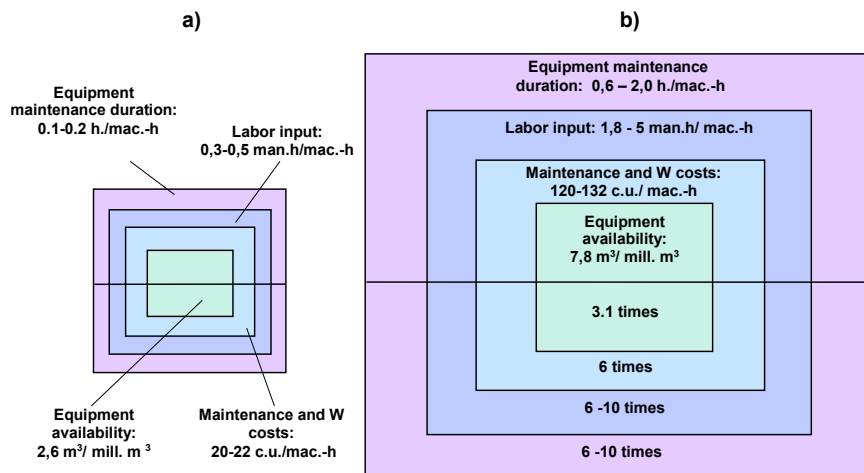


Fig. 1. Specific performance indicators of the repair service of foreign (a) and domestic (b) enterprises

Here is an excerpt from a letter from the chief mechanic of a large mining enterprise in Russia, which says that the applied methods of organization, planning of repair activities do not meet the conditions for the effective development of the enterprise and ensure the required operability of mining equipment:

“In the current conditions of development of the mining industry, there is an urgent need to optimize the costs of the main production, which naturally affects the financing of the repair activities of enterprises. This process fully extends to the activities of subdivisions of coal mining enterprises, non-ferrous and ferrous metallurgy enterprises.

The unsystematic nature of accounting and reporting, the allocation and write-off of costs, the lack of a well-coordinated mechanism for monitoring repairs and spending, and incentive levers are not conducive to solving this problem. And all this happens within the framework of the Regulation on preventive maintenance, which has not been revised since 1990, where, as is known, all planning is based on the gradually surviving method of the periodicity of repairs to develop mechanisms.”

The problem stated above posed the task for the heads of mining enterprises - ensuring the operability of mining equipment at an affordable cost with a guarantee of the quality of repair services.

The accumulated experience of transformations and the organization of efficient production at mining enterprises are considered in the works: A.S. Astakhova, V.I. Ganitsky, N.V. Melnikova, E.V. Petrenko, L.A. Puchkova and other scientists served as the basis for further research on this issue.

In this regard, the development of a methodological approach to the reorganization of repair production is of great importance, since it allows more efficient investment in the development of the enterprise and to ensure the operability of equipment on more favorable conditions.

It is known that in the repair industry there are differentiation standards for equipment groups depending on its purpose, complexity category of repairs, age groups, types of repairs and the nature of the work. This technique operates in enterprises of heavy, energy and transport engineering. This approach is necessary so that the planning of costs for equipment repair does not significantly differ from the real costs of the repair. [2].

Mining enterprises often use a different method. Higher services make decisions, allocate funds (“lower limits”) for repairs, and then oblige local executives to justify the feasibility of their decision and confirm the adequacy of the allocated funds. But ... be sure not to go beyond the established limits.

A significant part of the cost of servicing equipment is the cost of acquiring spare parts (Fig. 2)

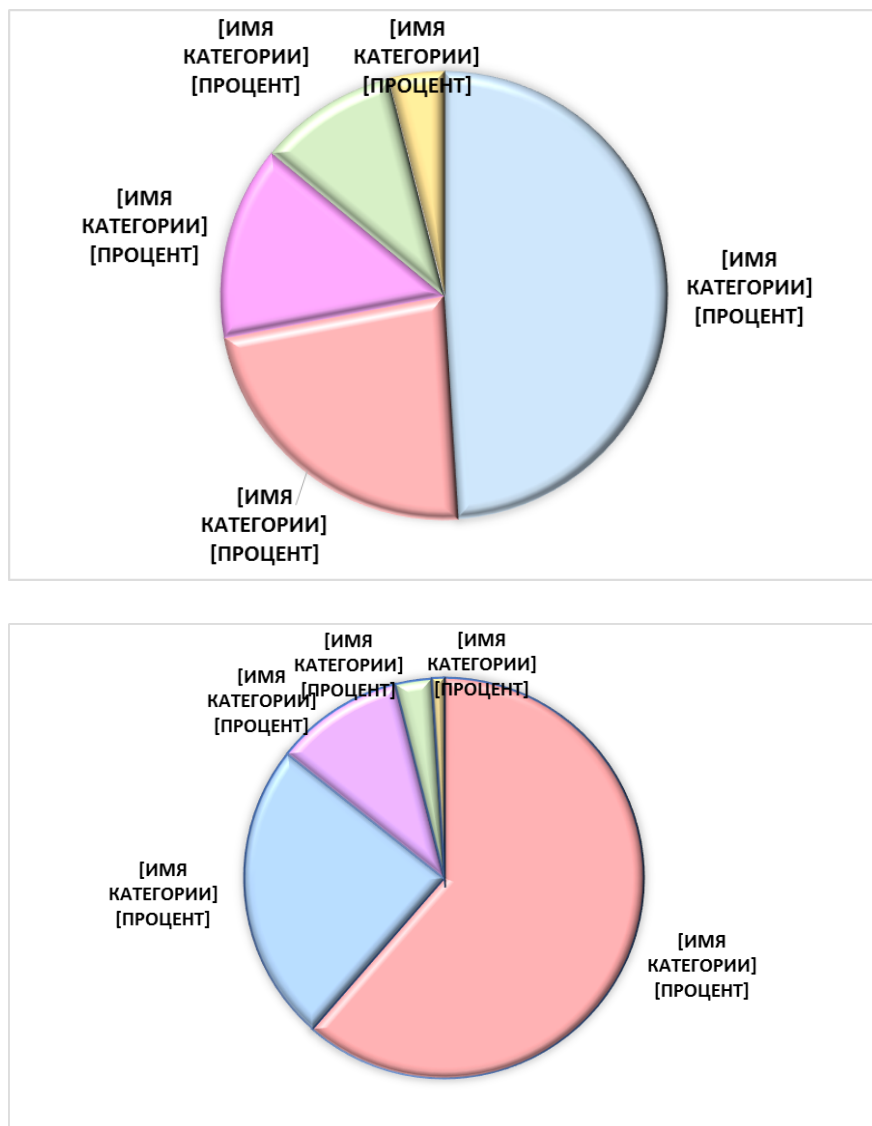


Fig. 2. The structure of the cost of energy-mechanical service sections of ME

The availability of necessary spare parts significantly increases the period of use of machinery and equipment reduces the time spent on repairs, facilitates the work of repair workers. But, as a rule, the high cost of spare parts for companies is a constraining factor when acquiring the necessary range of original spare parts, and as a result, the equipment is idle and the repair time is extended.

Missing spare parts are often made locally. As a result, these parts do not work out the standard hours, thereby increasing the number of unscheduled repairs. This happens due to the fact that these parts were made of randomly selected materials, as the manufacturer does not provide information on the materials from which these parts were originally made.

Repair of mining transportation equipment (MTE) is a labor-intensive and expensive process, and the costs associated with maintaining and supporting mining machines is 28-40% in the structure of the cost of mining. At the same time, the actual productivity of the MTE remains below its technical capabilities, the time of productive work of the main technological equipment, as a rule, is only 3800-4500 hours from the annual calendar time fund - 8760 hours. [3].

Obviously, the main reason for this situation is the existing economic mechanism, the inefficient organization of the repair system, the disconnected production and technical operation of MTE, their various economic interests, and imperfect methods for calculating resource consumption standards.

There is a way out of this situation. All over the world, small and large mining enterprises are engaged in the main production - mining, and "auxiliary work", including high-quality maintenance and repair of mining equipment, is provided by specialized firms or services with qualified specialists and experience in such work.

In the recent past, Russian mining enterprises took pride in being able to independently provide machine care and repair, with the appropriate repair facilities and labor for all types of services. Currently, most of them come to the conclusion that it will be more profitable to concentrate their efforts and resources on mining, and the repair service of equipment will be left to the service departments.

Mining equipment users tend to buy more than just a car. They need a function that allows them to realize certain economic goals, in particular, the production of the required volume of production at lower cost. Therefore, miners require technology manufacturers to guarantee that the improved characteristics of the machines (in terms of reliability, cost of an hour of work, material costs, quality of spare parts, etc.) will ensure their performance. However, the reliability of the operation of machines large-

ly depends on the level of their repair service, the process of managing which as an area of production services is still not sufficiently developed.

A set of measures of an organizational, technical and legal nature, ensuring the maintenance of equipment in a technically sound condition, that is, in a state of constant readiness for operation, is understood as a technical service system. In other countries, technical service is carried out directly by the manufacturer or through its branches, as well as through consortiums of suppliers of machinery and equipment, specialized companies on a contractual basis.

At Russian mining enterprises (ME), the material basis for the maintenance of mining equipment is the repair and maintenance base, which was created and operated almost without the participation of manufacturers as part of the mining complex. [4]

At the same time, a number of mining enterprises of "SUEK" JSC are in the process of forming a technical service as a system of services. This is due to the need: changes in the attitude of personnel to resources consumed in the repair service; ensuring mutually beneficial and effective interaction of enterprise units; raising the level of financial, technological and organizational discipline.

The transition of the repair service to new economic relations can take three forms:

- preservation of the traditional organizational structure and administrative mechanism of relations with the enterprise, which is accompanied by the opening of a personal account of technical services in general or centralized units (one or the other) for transferring a repair fund (budget) to it. This option provides for the advance of units with or without control over the types of costs, or control of the reporting indicator - the reliability of the equipment being serviced.
- formation of a specialized structural unit on the basis of existing repair production units (formation of in-house technical service).
- isolation (separation, outsourcing) of structural units from the enterprise and the establishment of independent repair structures - joint-stock companies - (with varying degrees of specialization) focused on effective commercial activities.

The formation of intra-company service on the basis of repair production requires a change in relations within the repair service and it with other structural units of the enterprise. When choosing an acceptable form of organization of repair production, it is possible to separate the repair production into a specialized structural unit that interacts with the company's divisions on mutually beneficial conditions. [5]

The separation (reorganization) of the repair service provides for the reform of the organizational structure, including the transformation of the composition of divisions and officials, their subordination and interaction.

The main condition for the transformation of the organizational structure is to ensure an economically feasible level of operational reliability of technical facilities and the transition to an economic mechanism for managing the service. The reorganization is reduced to the following sequential actions: increasing the level of centralization of personnel in specialized (in business processes) internal production functional units and the phased transition of these units to independence and economic relations with other departments of the enterprise (Fig. 3).

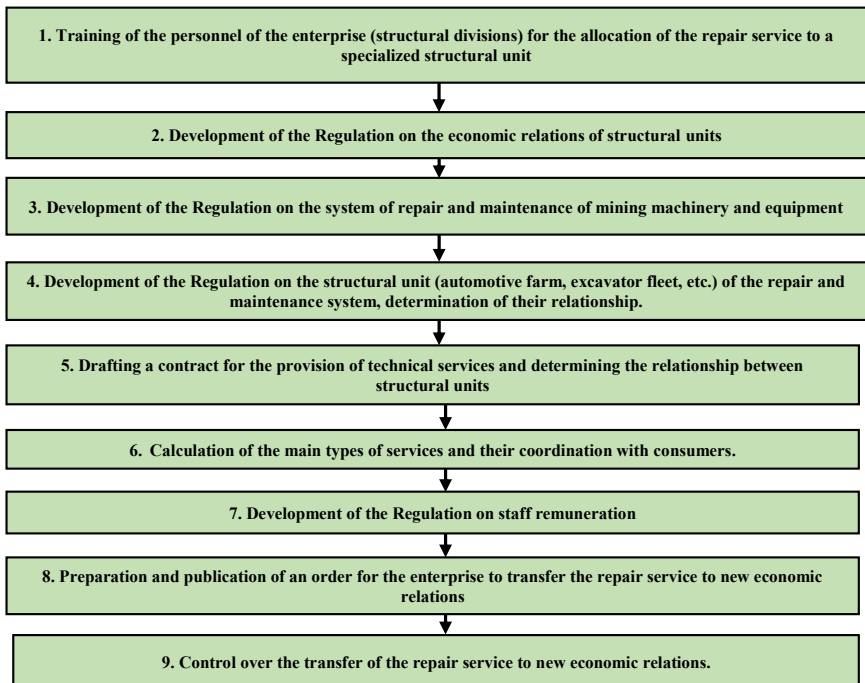


Fig. 3. The block diagram of the allocation of repair production in a specialized structural unit.

The possibility of transition to new economic relations is carried out after its justification on the basis of the analysis of the main business processes taking into account the types of technical objects and their corresponding services (mechanical, energy and electrical repair). The main

business processes include: preparation for repair; organization and carrying out repairs; performing maintenance; elimination of failures during the overhaul period.

When reforming the organizational structure of the repair service, a number of factors must be taken into account:

- technical condition of mining machines and equipment, the level of basic and operational reliability corresponding to them;
- the technical level of the maintenance and W of the systems of the enterprise, technical equipment, staff qualifications, etc.;
- the structure of the main functions of a specialized repair unit.

The decision on the degree of “freedom” of services should be preceded by economic calculations of the options for reorganization and the choice of technological specialization of repair units. [6]

To select the technological specialization of repair production, it is necessary to evaluate each structural subdivision (workshop, site) according to the characteristics of the technological level and production potential and assign it to one of the positions of the matrix constructed using the MC Kinsey model¹ (tab.1).

Table 1
Preference matrix of areas of technological specialization

Production potential	High	1	1	1
	Medium	2	2	2
	Low	3	3	3
		High	Medium	Low
		Technological level		

When assessing the technological level of production, the following characteristics are used: the availability of modern equipment; necessary technologies and staff qualifications.

When assessing production potential, the following characteristics are used: production capacity; production area; the possibility of building it up; having strong leadership; staff learning ability, etc.

Typical solutions when choosing the direction of technological specialization in accordance with the positions in the areas of the matrix:

¹MC Kinsey Model – multivariate model of analysis and establishment of strategic positions of a particular business, its capabilities.

- **High production potential and low technological level** (area 1). Production is used for the enterprise's own needs if the technological level is sufficient to produce products and provide services. It is possible to attract investments to increase the technological level in order to transfer units in the 4 or 7 matrix areas;

- **Average production potential and low technological level** (area 2). Production can be used for the company's own needs, if the technological level and production capacity are sufficient to produce products and provide services. It is possible to phase out production and attract third-party organizations to this type of work;

- **Low production potential and low technological level** (area 3). Production is being eliminated. If there is a need for this type of work, then third-party organizations are involved;

- **High production potential and medium technological level** (area 4). Production is used for the company's own needs. Free production facilities can be used to fulfill third-party orders. It is possible to attract investment to increase the technological level in order to transfer to matrix region 7;

- **Average production potential and average technological level** (area 5). Production is used for the enterprise's own needs if the technological level and production capacity are sufficient to produce products and provide services;

- **Low production potential and medium technological level** (area 6). Production is being eliminated. If there is a need for this type of work, then third-party organizations are involved;

- **High production potential and high technological level** (area 7). Production is used for the company's own needs. Free production facilities are used to fulfill third-party orders. Diversification;

- **Average production potential and high technological level** (area 8). Production is used for the company's own needs;

- **Low production potential and high technological level** (area 9). Production is used for the company's own needs. With insufficient production capacity, it is possible to increase production capacity by expanding production space due to liquidated industries, etc.

The structure of the main functions for the effective formation of a specialized structural unit is based on the development of the necessary acts, regulations, methods, instructions and other documents regulating the activities of the unit (Fig. 4).

The main method for the reorganization of repair production is the formation of effective interaction between structural divisions based on bud-

get management technology, which allows you to determine targets, form cost limits to ensure the required level of operability of mining and transport equipment, taking into account the economically reasonable cost of its maintenance. [7]

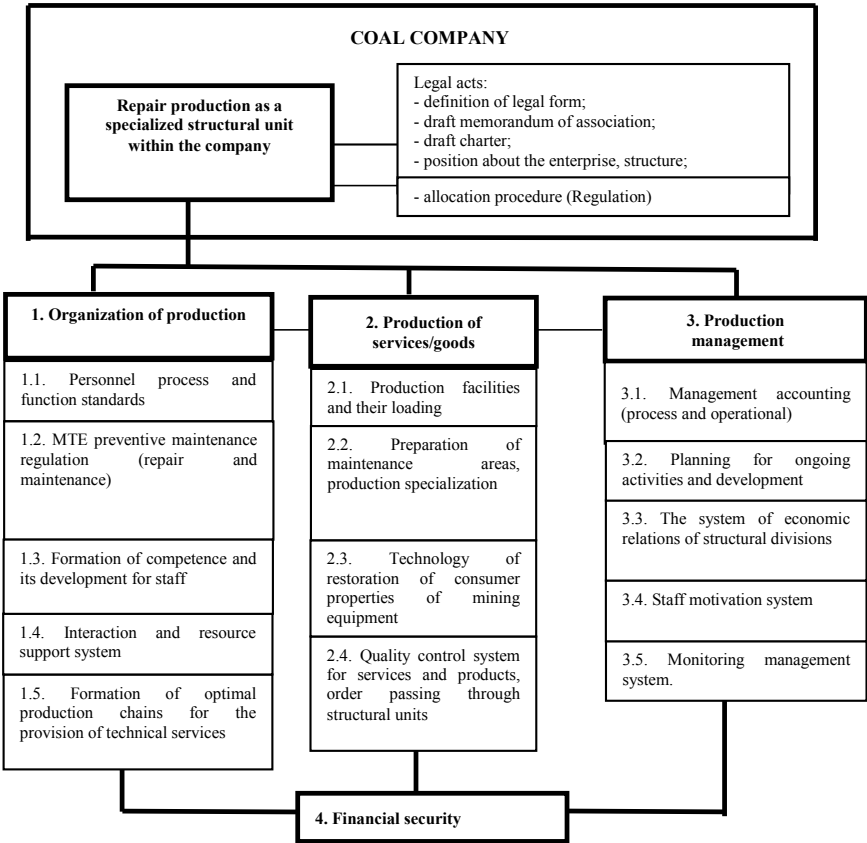


Fig. 4. The structure of the main functions during the reorganization of repair production into a specialized structural unit.

Summarizing the results of the study, it is important to note that the organization of effective interaction requires: a clear definition of the area of mutual responsibility and obligations of the heads of departments, a mechanism for economic control of the results of operations and, most importantly, an agreed position of the top management of the heads and specialists of the structural units of the mining enterprise.

Reorganization processes in the repair industry, aimed at ensuring the competitiveness and investment attractiveness of mining enterprises, become not only a real necessity, but also determine the relevance of solving the problem of determining the optimal number of production units, the level of their specialization and cooperation.

Formation of a system of in-house technical service at the mining enterprise will allow the management of the repair service to develop and make decisions based on an analysis of factors affecting the efficiency of the main production. This is achieved in the process of implementing a unified service policy of the mining enterprise, combining the capabilities of the manufacturer, the owner of the equipment and technical and production operation services.

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SOLUTIONS FOR THE EFFECTIVE FUNCTIONING OF A MINING ENTERPRISE REPAIR SYSTEM

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Improving the efficiency of repair work at a mining enterprise is an urgent task in modern conditions. The acquisition of new equipment, in particular imported equipment, an increase in production volumes and a complication of the design parameters of machines require significant changes in the activities of the enterprise's repair service. The article presents some solutions to improve the efficiency of repair of mining equipment by standardizing repair processes through the development of regulations, including the sequence of repair operations, the recommended tool, equipment, the quantitative and qualification composition of the repair team, operational security measures, labor costs for the work. The basic methods of forming an information system for the quality management of the production system are considered, the functions and the effectiveness of its use are determined.

Keywords: the effectiveness of repair work, the standardization of work processes, the repair system of a mining enterprise, information support.

One of the methods for the effective functioning of the mining company's technical service system is the standardization of work processes. Standardization refers to the process of developing and implementing standards that ensure the efficient organization of the production activities of units (sections) of an enterprise.

The object of standardization of work processes is the activities of the repair unit of the enterprise, including technological operations and consumed resources. In accordance with this, the standard of the workflow includes not only the requirements for indicators of reproduction of the process, but also the requirements for its safety, quality and efficiency.

Years of research have identified five levels of standardization. Each of which is characterized by a specific time structure of managers of different levels of management: director (D), chief mechanic (CM), site mechanic (SM), the operating mode of the work process and the main indicators of resource use (Table 1).

Table 1
Workflow standardization levels

Standardization level	Distribution of time of the head,%		Workflow operation mode	Main characteristics
1	2		3	4
High standard	D	5 95	The production system works stably in "lean production"	$k_{no} = 0,75 + 0,85$ $k_{un} = 0,80 + 0,90$ $k_{np} = 0,92 + 0,98$ $T = 0,01 + 0,02$
	CM	30 70		
	SM	50 50		
Medium standard	D	15 85	Efficient and stable operation of the technological system (TS); effective supplies and reserves	$k_{no} = 0,60 + 0,70$ $k_{un} = 0,65 + 0,75$ $k_{np} = 0,70 + 0,80$ $T = 0,05 + 0,08$
	CM	50 50		
	SM	70 30		
Basic standard	D	20 80	Effective, but not stable TS; not effective, but necessary supplies and reserves	$k_{no} = 0,40 + 0,60$ $k_{un} = 0,50 + 0,60$ $k_{np} = 0,60 + 0,70$ $T = 0,01 + 0,03$
	CM	70 30		
	SM	80 20		
Normalized job assignments	D	50 50	Irregular TS operation with unstable parameters	$k_{no} = 0,10 + 0,30$ $k_{un} = 0,15 + 0,35$ $k_{np} = 0,30 + 0,50$ $T = 0,10 + 0,30$
	CM	80 20		
	SM	90 10		
Irregular job assignments	D	85 15	Occasional TS inclusion; recovery of TS after accidents; solving personnel inappropriate targets; solving new tasks by staff	$k_{no} = 0,05 + 0,15$ $k_{un} = 0,10 + 0,20$ $k_{np} = 0,20 + 0,30$ $T = 0,50 + 1,00$
	CM	90 10		
	SM	95 5		

D – director;

CM – chief mechanic;

SM – site mechanic



- organization;



- control

k_{no} , k_{un} , k_{np} – utilization factors: respectively equipment, personnel, resources;

T – injuries, inj./mill. t

Depending on the operating mode of the workflow, the level of its standardization is determined. Standards are set for productive: equipment operating time, personnel operating time, resource use, and also taking into account the safe performance of work. [1]

When standardizing working conditions, the possibilities of improving labor safety are taken into account through the development of safe and efficient work standards established for the workplace.

As practice shows, it is impossible to avoid deviations from the established conditions for the process. However, any deviation causes additional consumption of resources, and consequently, an increase in costs. In order to save resources and effectively organize the production process, deviations must be taken into account for production facilities and for technological processes.

Thus, the standardization of technological processes and the elimination of deviations from the established standards of work is becoming one of the tools to improve the organization of production, allowing you to plan and predict the work of the enterprise and its structural divisions, as well as identify and use internal reserves of efficiency. [2]

The components and assemblies of mining machines have their own predicted resource, which is due to the laws of their wear. Studies have shown that four resource groups can be distinguished on all types of, for example, bucket excavators. The resource of each group has a common basis - the same number of excavation cycles for the same operating conditions. The resource groups of the main parts, assemblies, and systems are given in tab. 2.

Table 2.
Resource group characteristics

Nº of resource group	Type of repair	Number of excavation cycles of the 1-st repair cycle	Name of parts and assemblies included in the resource group	Number of excavation cycles of the 2-nd repair cycle
1	T_1	$0,0625 \cdot 10^6$	Wearing parts and items of work equipment	$0,0625 \cdot 10^6$
2	T_2	$0,25 \cdot 10^6$	Work equipment in general, brake system, pneumatic system	$0,25 \cdot 10^6$
3	$T_3 (C)$	$0,5 \cdot 10^6$	Electric cars	$0,5 \cdot 10^6$
4	K	$2,5 \cdot 10^6$	Basic parts, gearboxes, gears, main systems	$2,0 \cdot 10^6$

Resource groups of assemblies and parts form the basis of the system of preventive repair plans and ultimately determine the structure of the repair cycle of mining machines.

The resource forecast will be the more accurate the more standardized the operating conditions and repair processes. Depreciation of mining equipment is influenced by a group of factors acting on the machine over its life cycle W , which is composed of the environmental impact W_1 , the energy of work processes (for example, the stresses accumulated in the casting) W_2 , the potential energy (technological heredity) W_3 and the impact on machine during its repair and maintenance W_4 . Manifesting in mechanical, thermal, chemical, electromagnetic, and other forms, these factors determine the operating conditions of the machine and its elements - the occurring loads, voltages, temperatures, speeds and accelerations, chemical effects, electromagnetic forces, etc. These effects cause processes in the machine wear, corrosion, deformation, and others that lead to damage to individual elements: U_1, U_2, \dots, U_k . These damages cause changes in the output parameters of elements, nodes and subsystems, which, in turn, leads to a change in time and output parameters of the entire system $X_1(t), \dots, X_n(t)$ (Fig. 1).

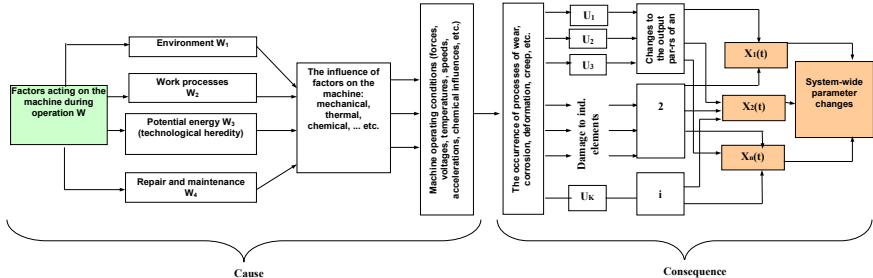


Fig. 1. Change of the output parameters of the technical system

Thus, by controlling the processes of wear, corrosion and deformation by monitoring the technical condition of specific nodes, it is possible to assess the state of the system as a whole, to predict the failure of a particular node and evaluate its residual life.

As a result of an express audit of the repair services of coal enterprises, it was revealed that one of the reasons for the poor quality of service for mining equipment is the lack of a reasonable composition and schedule of repair. The regulated scope of work is determined in order to prevent a progressive increase in wear and tear, to prevent premature failure of components and assemblies of mining machines.

The definition of standards for the duration and cost of labor for the repair of mining equipment is based on the study of technological processes, where, first of all, it is necessary to regulate the rational sequence of operations and their detail. [3]

The structural diagram of the system detailing meets the following requirements:

It contains all the nodes of the object, depicted in the form of rectangles, in which the names of the elements and assembly units are entered and their number is indicated;

Explains where the item is located, the assembly unit, and what needs to be disassembled;

It is divided into levels in accordance with the steps of entering each element of the product in the following order: object, product, system, subsystem, assembly unit of the first order, assembly unit of the second order, assembly unit of the third order, etc. The primary is a separate element.

Assembly units that are not disassembled under the conditions of the repair site, enterprises should be at the so-called "unacceptable" level (Fig. 2).

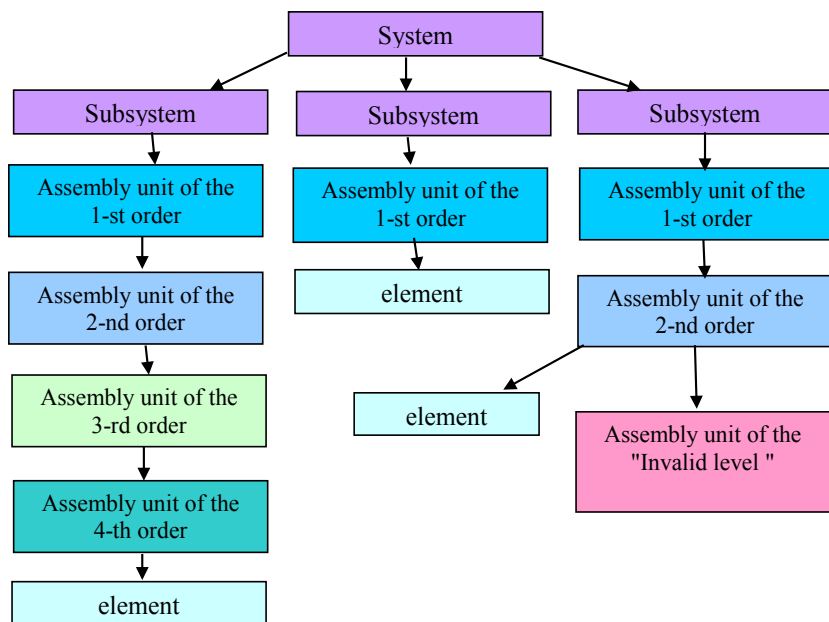


Fig. 2. Detailing system for assembly units

The sequence of operations is determined by the location of the graphs and links shown in the form of arrows. The main elements to be dismantled are indicated in the middle columns arranged vertically in one column. To the left of the vertical line are graphs of previously removed parts. To the right of the vertical in horizontal directions are graphs that determine the sequence of disassembly of the dismantled nodes (Fig. 3).

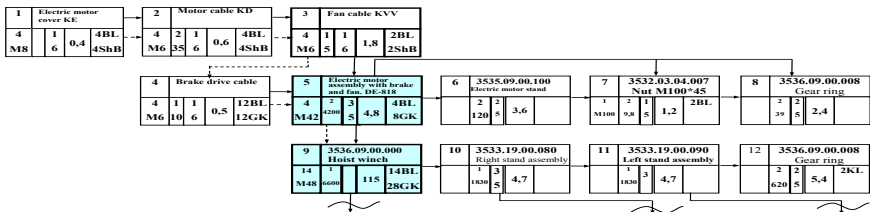


Fig. 3. A fragment of the structural diagram of the dismantling of the winch lifting the excavator EKG-10

Technological regulations developed on the basis of this method have been implemented and are effectively used in the preparation, organization and conduct of all repair work at many coal mining enterprises, such as: "Kuzbassrazrezugol" HC, "Vostochno-Beyskiy Razrez" JSC, "Ekibas-tuzkomir" JSC, "Kovdorsky GOK" JSC, "Razrez Vostochny" LLC also at other mining enterprises.

In the activities of large traffic police, representing a large number of day-to-day connected and interacting units, the transmission of information is the primary factor in the normal functioning of the enterprise. [4]

Information on the occurrence during the production of deviations from planned indicators requiring operational decisions is important.

The information system performs the following functions:

- determination of the needs of each specific leader in the nature and content of the information he needs for operational management purposes;
- determination of the need for technical means;
- centralized planning of all costs;
- determination of the level of costs for the use of technical means in the information system;
- ensuring the proper level of collection, storage and provision of information;
- development of software tools, application programs.

Due to the fact that the need for information (technological, preparatory, temporary, cost, qualification) and operational documents is different for mechanics of different levels of management, tasks for making managerial and executive decisions are defined. All tasks are linked according to the functional basis and are divided into 4 groups:

1. Tasks that implement the function of planning and production;
2. Tasks that implement the function of accounting and analysis;
3. Tasks reflecting economic indicators;
4. Tasks, reflecting the movement of material values, personnel (Fig. 4).

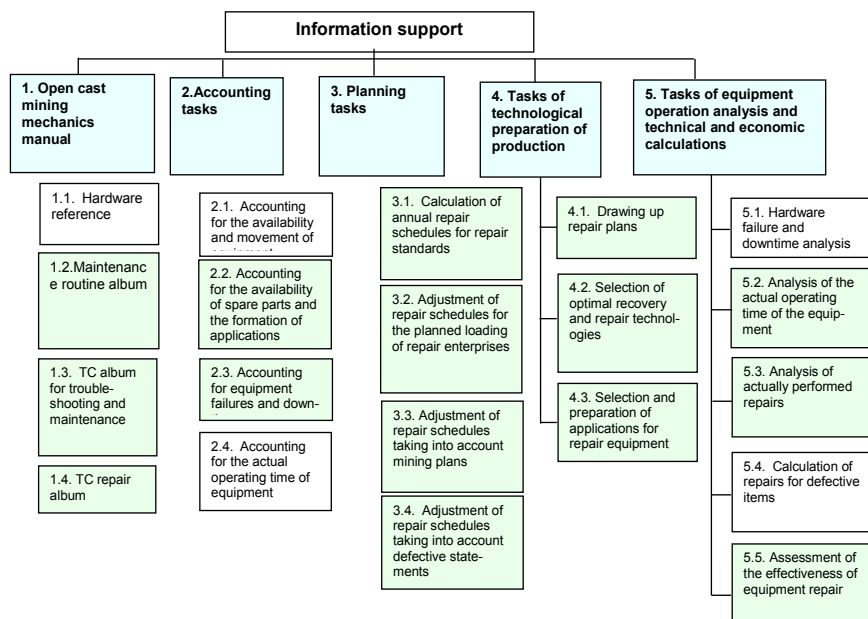


Fig. 4. Fragment of the information observance system of the repair service

Advances in computer technology have improved the systems for automated control of repair processes. [5] Currently, a number of enterprises have developed peripheral technical means that allow direct communication of computers with mining equipment. For example, in the "Chernigovets" section, an automated dispatching system for "KARIER" dump trucks was introduced. During the phased implementation of the system, 30 BelAZ-7512 dump trucks and 2 BelAZ-75131 dump trucks were equipped

with on-board equipment sets and a control center was commissioned. The "KARIER" system was developed with the aim of increasing the operational management of the operation of heavy dump trucks by continuously providing dispatch and managerial personnel with complete information about the current situation and technical condition of dump trucks. Application of the "KARIER" system allowed:

- reduce preparation time for repairs and reduce labor costs by 5 to 10 times;
- reduce time and improve the quality of repairs;
- provide with the necessary information all levels of management and execution during all types of repairs and maintenance;
- reduce costs by reducing emergency stops by improving maintenance and repair;
- reduce injuries and increase the responsibility of all workers involved in the repair work.

Calculations of economic efficiency from the implementation of the information system showed that due to the growth in the productivity of dump trucks by 4.5%, additional marketable products worth 56.2 million rubles were obtained.

Thus, the developed normative and repair-technological documentation for the safe organization and conduct of repair work allows standardizing the processes of repair actions, determining the nomenclature of mechanization tools, and regulating the time and labor costs. The developed software and technology complex based on data on equipment status, regulations and procedures for performing operations, resource consumption rates, and personnel qualifications is a necessary step in the formation of a unified information system for equipment maintenance and can reduce repair time by 15-20%, and the complexity of operations - by 20-25% and the cost of repairs - by 17-25%.

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ON THE NEED TO DEVELOP COMPETENCIES OF EMPLOYEES OF A MINING ENTERPRISE IN TERMS OF ENSURING SAFE WORKING CONDITIONS¹

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The successful operation of mining enterprises requires their adaptation to constantly changing environmental conditions. In the conditions of transitional processes, production safety is of great importance, and risk management becomes the key way to ensure it. The article shows that the development of the risk management function in mining enterprises is ensured by the application of a competency-based approach.

The basic ideas of a competency-based approach to ensuring the safety of mining enterprises are outlined. Formation (or adjustment) of the competency system and ensuring the competence of employees corresponding to it are a method of integrating risk management activities in the production activities of the enterprise. The results of the implementation of the competency-based approach at mining enterprises made it possible to confirm the appropriateness of its application, as well as to supplement the competence development algorithm with a compensating mechanism: the lack of competence of workers in terms of ensuring production safety and, in particular, performing the risk management function is compensated by adjusting the competencies of the company's managers and specialists.

Keywords: production safety, mining, safe working conditions, risk, risk management, competency, competence.

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Introduction

The adaptation of mining enterprises to the constantly changing conditions of their functioning is a complex and continuous process. Field development conditions are changing - their complexity and depth are growing; dynamically developing socio-economic conditions for the functioning of enterprises. The existence of transient processes, which are understood as technical, technological and organizational actions when implementing the adopted innovative decisions on adapting the mining engineering and organizational-technological system of the enterprise to the changing conditions of its functioning [1], determine the importance of production safety as one of the main competitive advantages of the mining enterprise.

Within the framework of the functioning of the production safety system, the specific features of the transition period of the mining enterprise, which are most often its main problems — the inhibition (inertia) of the reproduction process and the development of new forms, elements and economic institutions - can be leveled, provided that safety activities during the transition period will be focused on reducing the level of risk [2].

It is the risk management function that is the prospect for ensuring the safety of production at mining enterprises during the transition period. The implementation of this function requires changes in existing competencies of employees. This is due, firstly, to the need to decompose the risk management function by the levels of enterprise management and determine specific tasks for officials. Secondly, practice shows that in especially hazardous industries not all hazards can be reliably identified, their risk can be assessed, and measures and actions to eliminate them or reduce the risk level can be envisaged. Competence should include knowledge, skills, and authority to identify new dangers and respond quickly to them. Therefore, personnel should be able to do this, that is, have sufficient competence.

Thus, the formation (or adjustment) of the system of competencies and ensuring the competence of employees corresponding to it are a method of integrating production risk management activities in the production activities of the enterprise.

The concepts of "competency" and "competence"

In the early 2000s, focused work with such concepts as competency and competence was launched at several coal mining enterprises of Kuzbass. Its necessity was confirmed by the fact that according to the analysis of statistical data and the experience of domestic and foreign mining enterprises, the level of industrial injuries was caused by 3-7%

hazardous working conditions (mining, geological, natural and technical and technological factors) and 93-97% - hazardous actions of personnel: deviations from job descriptions and technological instructions, violations of safety rules, personal negligence. That is, the matter was not only and not so much in the qualifications of the employees: the reasons for the dangerous actions of the staff were most often the discrepancy between the functions performed by the professional qualifications and qualifications in the field of safety, as well as the ineffective use of authority - that is, insufficient competence of the employees.

Analysis of the definitions of the terms "competency" and "competence" that existed at that time in pedagogy and were applied in the field of personnel management [3], allowed us to give the following definitions:

Competency - these are professional requirements (qualification, authority and responsibility) "collected" to solve a specific task or implement a specific function. A function or task is a kind of competency boundary.

From this definition, we distinguish the signs of competency: it always has boundaries, since it is formed according to a task, function or range of tasks, that is, it is impossible to form competency "in general", you always need to determine its area; includes not only the requirements for the qualifications of employees, but also the established scope of authority for solving assigned tasks, and also determines the object and the measure of responsibility of employees for fulfilling or not fulfilling assigned tasks.

Formation of competency - is an organizational task. Given these characteristics, its essence is that, in accordance with the task (function):

1) the requirements for the qualifications of the employee (or group of employees) are determined;

2) the scope of powers necessary and sufficient to solve problems is established (this is access to the disposal of material or intangible resources of the enterprise);

3) an object or area of responsibility of the employee is assigned (it can be a physical object or a planned target result that needs to be achieved) and a measure of this responsibility, that is, encouragement or punishment when fulfilling or not fulfilling a task (function).

Competence - is a measure of compliance of an employee's qualification with the real level of complexity of the functions (tasks) performed by him within the framework of existing authority. The competence of the employee implies not only the presence of a certain level of professional knowledge, skills, but also the ability to apply them in a timely and appropriate manner. In addition, the employee's competence cannot be assessed "in general", it is a measure of compliance with specific tasks and

functions, both from the point of view of the employee's qualifications and in the aspect of the effective (efficient) use of his authority and responsibility. And only having determined the competency of the employee, that is, specific requirements, can we talk about increasing the competence of the staff. Moreover, increasing the level of competence is the task of personnel management.

Such an understanding of the competency and competence of workers shows that they are much broader than the concepts of "qualification" and "qualified". Qualification - although basic, but only one of the components of the concept of "competency", so the mistake is their identification. Another, already practical mistake is the formation of competencies and the assessment of the competence of employees of an enterprise using exclusively personnel management services (human resources, etc.). To achieve a positive result, the formation of competencies and the assessment of competency must be carried out by almost all services and departments of the enterprise, both managerial and production.

Formation of a system of competencies and increasing the level of competence of employees

In the study [3, 4], using the proposed criterion of competence of a group of workers, a significant effect of staff competence on the level of occupational injuries was proved. Therefore, the idea of reducing the level of injuries based on the development of staff competence was tested. The implementation of the proposed approach in the early 2000s made it possible to obtain results that satisfied enterprises: production control services were formed to ensure the required level of effectiveness of their functioning, and the number of injuries due to organizational reasons, in particular insufficient staff competence, was reduced. Positive results of testing allowed us to propose an algorithm for the development of personnel competence in the field of ensuring production safety, which includes three main stages:

Stage I. Formation of a system of competencies.

This stage involves the determination of requirements in the field of ensuring production safety for each official level, profession, etc. by vertical and horizontal hierarchies of enterprise management. Requirements are determined on the basis of the tasks and functions regulated by legislative and regulatory acts, as well as local tasks and functions defined by the enterprise management. The scope of authority and qualification requirements for employees are given in accordance with the functions of each level of management. To implement these measures, it is advisable to use the method of structural-functional analysis.

Stage II. Diagnosis of the existing level of staff competence and identification of priority areas of work with competence to reduce injuries.

At this stage, any techniques and methods can be used to assess the employee's compliance with the functions performed and the effectiveness of the use of the powers assigned to him. However, one of the reliable sources of information on the competence of personnel are acts of investigation of industrial accidents. Analysis of the acts of investigation allows you to diagnose the competence of personnel and identify workers (or a group of workers) whose actions determine the state of injury, as well as reliably establish the causes of inadequate situations of action.

Stage III. Identification of competency development methods.

According to security officials (management levels) that are priority for ensuring safety, development programs are developed at the enterprise - both individual employees and services, departments, systems; Measures are planned and developed to develop the competence of employees: advanced training (training, certification), changing job descriptions, introducing a system of incentives for trouble-free work, the formation of a mentoring system, etc.

The disadvantage of the proposed algorithm, as shown by the practice of its development, is its insufficiently quick reaction to changes in the functions and tasks of personnel: any innovation requires the complete passage of all its stages. For example, the need to master the risk management function in domestic mining enterprises required the adjustment of the competencies system and, as a consequence, the development of the competence of workers, taking into account new requirements for fulfilling this function.

Aspects of mastering the competence approach in mining enterprises

The approach to reducing injuries based on the development of personnel competence was used to ensure the safety of mining enterprises at different times, in different volumes and with different depths of study [5-11]. Moreover, this problem is solved at the mining enterprises both at the strategic and operational levels of production management. The implementation of a competency-based approach on the example of the risk management function in LLC "United Production Transport Administration of Kuzbass" (hereinafter - UPTAK) deserves the greatest attention, since the results obtained at this enterprise made it possible to systematically develop this approach.

Technical and economic factors in the development of production have led to the fact that in UPTAK every team, even if it is a crew, a team, must manage risk. When performing work, carrying out processes and opera-

tions due to the influence of many factors, the accumulation of discrepancies in the actions of personnel to the requirements of labor functions, developed in accordance with professional standards and technological maps, is accumulated. Therefore, it was especially important to manage risk directly at workplaces, where for the prevention of these deviations (that is, for the rapid development and implementation of proactive measures for every deviation of personnel actions from the requirements of labor functions and actual operating modes), their reliable accounting and forecast are required.

To this end, UPTAK has developed and applied methods for estimating deviation frequencies. As a calculated weighted average value of the number of deviations per month, the deviation frequencies were estimated: in the actions of personnel from the requirements of labor functions; actual operating conditions of sections and equipment from the requirements of technological maps; preemptive actions, as a system reaction to the occurrence of deviations caused by the influence of external and internal environment. Figure 1 shows the frequency graphs of the indicated deviations in the UPTAK operation in 2018.

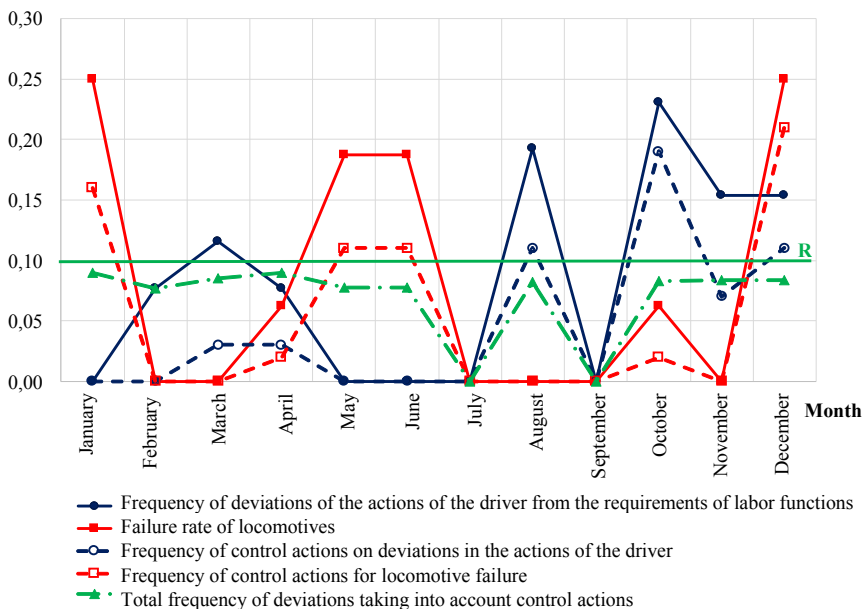


Fig. 1. Graphs of deviation frequencies and compensating control actions within the acceptable risk level [12]

The total graph of deviation frequencies taking into account anticipatory effects is depicted as a dash-dot line. The task of risk management in UPTAK is to keep it at an acceptable level, that is, the position of the total deviation frequency graph should not exceed the acceptable risk level R accepted at the enterprise². The figure shows the relationship between the competence of operational personnel and managers and specialists: the required level of risk is met thanks to effective anticipatory impacts. That is, the level of competence of operating personnel is not always sufficient to ensure safety. The required level of production safety is ensured by adequate anticipatory impacts, that is, the competence of UPTAK managers and specialists.

With this in mind, UPTAK has developed a model for the formation of professional competencies, in which the algorithm for the formation of competencies and the subsequent alignment of the competence of employees, as described above, has been strengthened. When implementing the competency-based approach in this model, the determination of requirements for employees is carried out in more detail and is justified: the results of expert evaluation of individual and professional competencies, as well as the results of cognitive analysis and assessment of deviations, are used. But the main difference between this model and the previous one [3, 4] is that a kind of compensating mechanism is laid in it: if, according to the results of an assessment of the individual competence of employees of the operational level, it will be deemed insufficient, then adjustments can be made to the competency of managers and specialists of the company (fig. 2).

The presence of a compensating mechanism is due to the fact that the existing level of deviations of decisions and actions of employees from the required functions and equipment operation from the technical regulation is adjusted only due to the proactive actions of UPTAK managers and specialists (see Fig. 1).

In practice, the competency-based approach was implemented as part of the development and implementation of the UPTAK Personnel Policy, and with the development of almost all of its areas. But the main directions of the Personnel Policy related to changes in competencies and increasing the level of competence of employees were personnel selection, adaptation of the employee and staff development. Qualitative staff selection, increasing the level of professional competencies, the introduction of new management methods for the period 2013-2018 led to a decrease in the frequency of traffic accidents by an average of 3-4% per year.

²Acceptable in UPTAK means the level of risk that does not impede the implementation of the production plan (established by calculation).

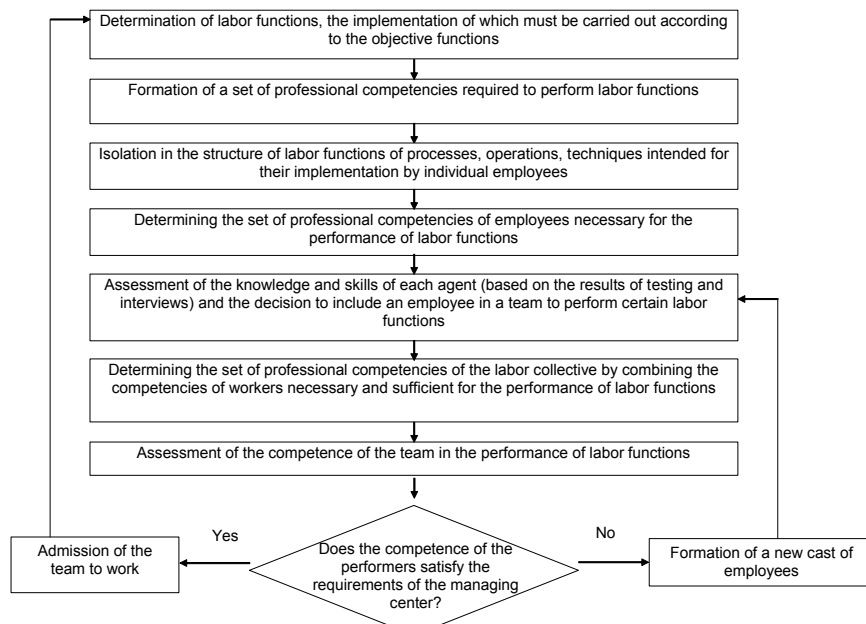


Fig. 2. Model for the formation of professional competencies of a team [12]

Thus, the work done at UPTAK allowed us to implement and develop the competency-based approach formed in the early 2000s. Its implementation allows the labor collective to perform a given set of labor functions of the corresponding structural unit of the loading and transport company and to provide safe working conditions quite efficiently.

Prospects for the application and strengthening of the competency-based approach

Given the fact that an acceptable level of risk will change due to new stages in the socio-economic and technical and technological development of the mining enterprises functioning environment, in order to implement a competency-based approach in the future, restrictions may arise associated with the need to ensure a high reaction rate of enterprise systems to changes. Within the framework of the above approach, this will be difficult to do, because:

- it is not possible to quickly form and develop the competency of an individual employee, because it is associated with the need to institutionalize it (legalize, give status), that is, make numerous changes to

the local documentation of the enterprise - orders, regulations, standards, job descriptions and instructions for certain types of work, etc.

- in contrast to the individual, competency of a group (collective) is formed quite quickly, but it is created as a set of individual competencies, while collective competency - is an integrated collection assembled for a risk management task/function;

- when mastering the risk management function, it is not yet possible to take into account the fact that risk is not only a threat, but also an opportunity, and the possibilities relate to both ensuring safety and achieving production efficiency.

Based on the foregoing, the immediate prospect of developing a competency-based approach is seen in 2 directions: the active development in small groups (crew, team) of risk management functions and the search or development of ways to work with competency to increase the reaction rate of the system.

Conclusions

1. The need for adaptation of mining enterprises to the constantly changing conditions of their functioning determine the importance of production safety as one of the main competitive advantages of a mining enterprise. The development of the risk management function is a promising area for ensuring the safety of mining enterprises. Acceptance of production risk as an object of management allows us to take into account both the risks of injuries and accidents, and the failure to fulfill the production task, that is, allows us to ensure a balance of production efficiency and safety.

2. The risk management function requires the formation of a competencies system at the strategic management level (the need to master the function as such at all levels of the enterprise management) and its constant adjustment at the operational management level (the need to identify new dangers and adequately respond to them during the production process).

3. The algorithm for the development of personnel competence in the field of production safety, which includes three main stages - the formation of a competencies system, the assessment of competence and bringing competencies in line with the competencies system - was supplemented by a compensating mechanism. The essence of the mechanism is to compensate for the lack of competence of employees of the linear level of management of the competency of managers and specialists. The work of the compensating mechanism will allow for the creation of a labor col-

lective capable of performing a given set of functions at an acceptable level of risk.

4. Formation (or adjustment) of the competencies system and ensuring the competence of employees corresponding to it are a method of integrating risk management activities in the production activities of an enterprise.

5. Suitable directions for developing a competency-based approach are: active development in small groups (crew, team) of risk management functions; development of ways to form the competence of the personnel of the mining enterprise, allowing to increase the speed of adaptation of the enterprise to constant changes in its functioning environment.

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CAVE PEARL IN THE KARST CAVITIES OF THE SOUTHERN URALS

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Cave pearls - are a rare mineral formation. Information about their appearance in the caves of the Southern Urals is summarized. A characteristic of cave pearls is given, an analysis of its occurrence in karst cavities is made, and the main patterns of their distribution are established. An assessment of the current state of cave pearls in the caves of the South Urals is given.

Keywords: cave pearls, Southern Urals, karst caves, oolites, pisolites, concretions.

Introduction

Along with various cave neoplasms in the cavities of karst origin, calcite oolites, pisolites, and concretions are sometimes formed, often referred to as cave pearls.

Cave pearls got this name because of the similarity of their forms, composition and internal structure with biogenic pearls. Usually it has a spherical shape, calcite composition and concentric structure.

Cave pearls are not as beautiful as pearls formed in bivalves, are not a precious stone and have their attractiveness only in a cave environment.

Cave pearls in the karst cavities of the Southern Urals have been known since the mid 60s of the last century. Over the past 25 years of studying karst caves by cavers of Ufa, Sterlitamak, Salavat, Sverdlovsk, Kungur, Saratov, the number of karst caves discovered in the Southern Urals has almost doubled. So, if on 01.01.1993 in the Southern Urals about 400 caves were known [8], on 01.01.2020 the number of examined caves in the considered region reached 958. Naturally, the number of caves with finds of cave pearls also increased. Meanwhile, information about it in previously unknown caves is not generalized at present, the patterns of its occurrence in the caves of the Southern Urals are not disclosed.

Purpose of the study and initial data

The aim of the research is to analyze the occurrence of cave pearls in the karst cavities of the Southern Urals, establish patterns of distribution of caves with finds of cave pearls, and evaluate its current state in them.

The initial data for the studies were the data of cavers on the newly discovered karst caves for the last 25-30 years and the author's own field studies.

To the history of the study of cave pearls

In the former USSR cave pearls were first described in 1955 by G.A. Maximovich from the Kizelovskaya cave. In his monograph *Fundamentals of Karst Studies* [6], he outlined the first original studies of cave pearls. For the first time in Russian literature, he generalized material on cave pearls, and also gave possible ways of its formation. The author of the monograph indicates that until 1963 in the Soviet Union cave pearls were found only in 19 caves, of which in Perm Oblast - in two, in the Caucasus - in four, in Crimea - in twenty and in the Far East - in one.

Currently, this figure has increased markedly, and the geography of the distribution of caves with finds of pearls in them has expanded significantly. It was also found in caves of the Southern Urals [7].

The published literature contains information on the presence of oolites, pisoliths and concretions in the following caves of the Southern Urals: Maksimovich [12], Fourth Kutuyskaya [5], Kalkaman-Tishek (Bol. Timirovskaya) [4], Novo-Muradymovskaya [11], Kinderlinskaya named after 30th anniversary of the Victory (Victory) [1].

Speleologists' reports provide data on the presence of cave pearls in the caves: Pearl, Pearl 2, Cascade, Medvezhya (Ziriklinskaya), Salavat, Tuburmanskaya, Tufa stream, Ustryamtsev and at least 10 other caves of the Southern Urals. Meanwhile, they are usually limited only by the fact of its presence and a brief description of its shapes and sizes. Summary data on the karst cavities of the Southern Urals with finds of cave pearls are currently missing and are presented for the first time.

Results and discussion

Cave pearls in the karst cavities of the South Urals, as in other caves in Russia [2], are represented by oolites, pisoliths and concretions [7], which are formed at the bottom of the negative forms of the microrelief of karst cavities - small lakes, droppers and gouras filled with saturated calcium carbonate water (fig. 1).

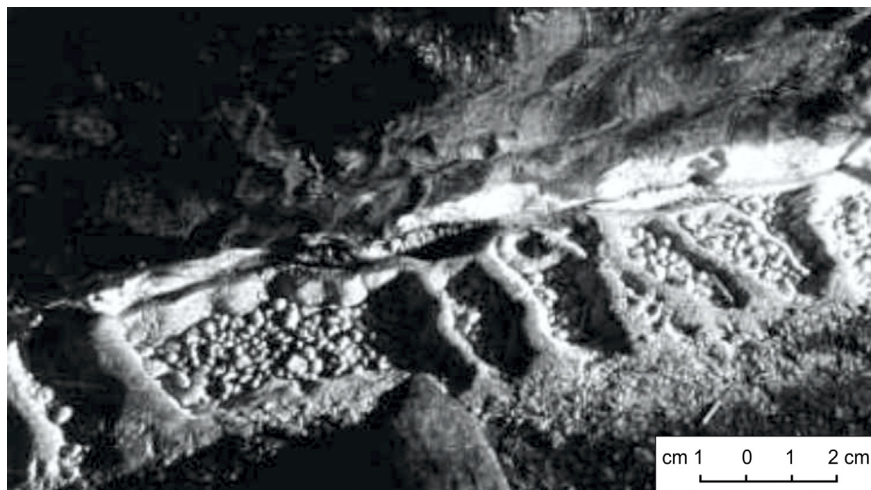


Fig. 1. Cave pearls in the Novomuradymov cave, 1970 [11]

Sizes of pearls in caves of the Southern Urals usually range from 1-2 mm to 2-3 cm, however, significantly larger pearls are sometimes found. So, in one of the caves on the river. The white author met a pearl, the dimensions of which along the axes of the ellipsoid were 7.5x6.0x5.0 (!) cm.

Varieties of cave pearls in the karst cavities of the Southern Urals are found in three types [7].

Cave pearls of the first kind are usually pure white, light gray, less often gray, have a smooth surface. In the section, it does not have a core represented by a foreign body, and if there is one, it is a small piece of clay or a grain of sand and the color of the pearls takes on more gray tones (Fig. 2).

Cave pearls of the second type have yellowish and brownish-gray, less often light brown colors. Their surface is rough, and the cores are represented by pieces of clay mixed with small grains of sand (Fig. 3). Cave pearls of the third type of gray, light brown and brown color have a rough surface often with numerous spherical and isometric growths. Their cores are represented by grains of sand and even small pebbles (Fig. 4).

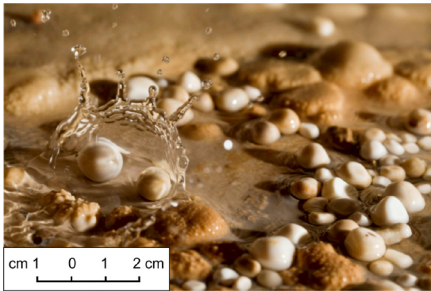


Fig. 2. Pearls of the first kind

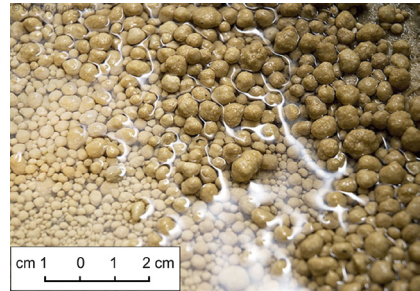


Fig. 3. Pearls of the second kind

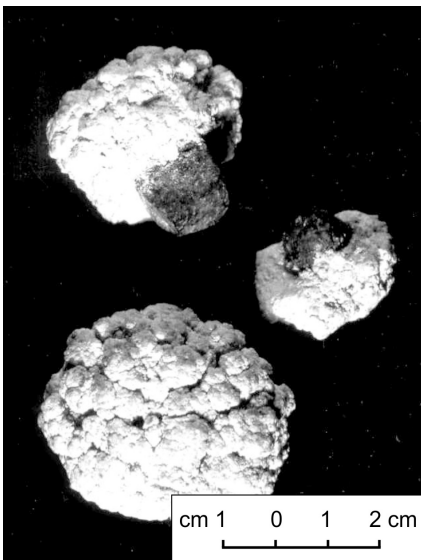


Fig. 4. Pearls of the third kind

If the shape of cave pearls of the first and second types is spherical or ellipsoidal, then the shape of pearls of the third type is more diverse - from spherical to irregular angular. Sometimes the shape of the pearls follows the shape of the core. So, the shape of one of the found pearls in a cave on the river Belaya repeat-

ed in general terms the shape of a small prismatic pebble inside (see Fig. 4). Cave pearls of the third kind are different from the first as well with greater hardness.

The noted differences in the shape and structure of cave pearls are associated with the features of its formation, which are well known to cavers.

Oolites, pisolites, and concretions of the first type were formed mainly due to surface tension forces (according to GA Maksimovich [6]). Dripping from the vaults of the cave into droppers, baths, gouras, small suspended lakes, water saturated with calcium carbonate, contributed to the rotational movement of the nuclei of cave pearls. In this case, it was formed in a saturated solution, due to surface tension forces that tend to give the substance a spherical shape. An additional factor in the formation of pearls of the first type is the absence of impurities in the microforms filled with water on the floor of the cave.

Oolites, pisolites, and concretions of the third type were formed due to precipitation of calcium carbonate gels from a saturated solution and their growth around foreign bodies (according to DP Grigoriev [3]). The dripping water entering the droppers, tubs, gouras and shallow lakes agitated their bottom, suspended particles of clay and sand grains, and with more intense water circulation, small pebbles. Around them, in a solution saturated with calcium carbonate, a calcite shell was formed due to molecular cohesion forces. At the same time, suspended small particles take part not only in the formation of the pearls themselves, but also are the kernels of oolites that develop on the surface of larger grains of cave pearls, which makes their surface rough with numerous growths. Moreover, calcite growths often envelop foreign bodies that have fallen into droppers (Fig. 5).

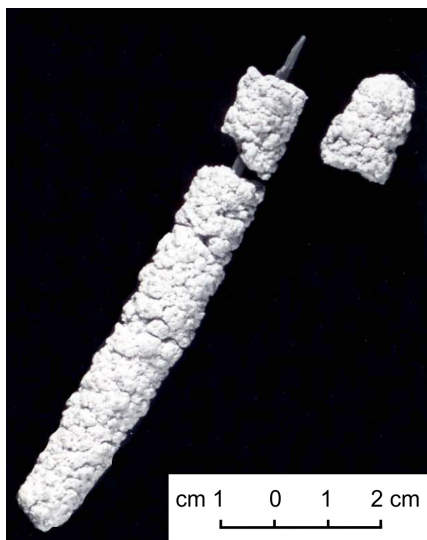


Fig. 5. Calcite growths on a straw

As for the ooliths, pisoliths, and concretions of the second species, they are probably a transitional type between the first and third species.

It is characteristic that various types of cave pearls are found in the same negative form of the microrelief of karst cavities, which indicates an unstable water regime of their condition.

Distribution of karst cavities with cave pearls. In modern speleological zoning, the territory of the Southern Urals belongs to the Ural speleological country, where the West Ural and Central Ural speleological provinces stand out. In the first, the region under consideration belongs to the southern caving region, and in the second, the caving region of the Bashkir

megaanticlinorium and the caving region of the Zilairo-Emba synclinorium are separated [2]. Of all the karst cavities known for 01.01.2020 in these speleo regions that are accessible for human penetration (958 pcs.), only in 24 the presence of cave pearls was reliably established, which is only 2.5% of all the karst caves examined in the region explored today.

The main feature of the distribution of karst cavities with the presence of cave pearls in them is that the vast majority of them are located in the southern caving region of the Western Urals caving province and only one cave Kyzilyarovskaya named after Maksimovich is located in the caving region of the Bashkir megaanticlinorium of the Central Ural speleological province.

The cave named after Maksimovich is embedded in the limestones of the Minyar Formation of the Upper Riphean ($R_3\ mn$). It is the largest cave in the Riphean limestones of the entire Ural speleological country. The total length of its courses as of 01.01.2020 is 2217 m. [10] The cave is not typical of the Southern Urals, since similar large caves in the often metamorphosed carbonates of ancient formations within it are not known today [9].

The cave named after Maksimovich is formed in the radical bend of the Inzer River. The main labyrinth-lattice part of the cave is represented by a system of obliquely horizontal relatively narrow and high corridors and galleries, extending along the azimuth of $285-310^\circ$ and developed along a system of intersecting tectonic cracks in the inner part of the river bend [12]. The longest corridors are parallel to the dividing line at the bend of the river, and the short ones are oriented perpendicular to it. It was the formation of the cave in the bend of the river along the system of intersecting cracks that caused its significant size [9, 10].

Cave pearls in the cave named after Maksimovich of the second type with a diameter of 1.5-2.0 cm was found in the grottoes of Proval and the Cross [12].

In the West Ural speleological province, the presence of cave pearls in 23 caves has been reliably established. Almost all of them are inherent in the pure composition of the Lower and Upper Devonian (D_1 and D_3) and Lower Carboniferous (C_1) limestones. Only one cave with single finds of cave pearls is developed in Middle Devonian limestones (C_2).

No pattern of distribution of karst cavities with the presence of cave pearls in them from their absolute altitude location (208-400 m, abs.) and their size (length from 25-50 m to 10-13 km) is traced. Meanwhile, almost all caves with finds of cave pearls are located above the nearest bottoms with draene-valleys with an excess above 40 m (up to ~ 170 m), are of pre-

Pleisthenian age ($> Q$) and are at the final dry stage of their development. Only one cave with single finds of cave pearls in the valley of the river. Beloy is located at the level of the third floodplain terrace (Q_2).

There is no doubt that the main condition for the formation of cave pearls in karst cavities is the presence of negative forms of microrelief, in which the accumulation of calcium carbonate from the hollow from the vaults of the cavity takes place. At the same time, small suspended lakes, droppers and gouras are peculiar, first of all, to caves, which are at the stage of talus [8] development. That is, the established laws of the spatial distribution of the caves of the Southern Urals with finds of cave pearls do not contradict the conditions of its formation.

The current state of cave pearls. Unfortunately, from all (!) caves listed above in the article, pearls are removed, and droppers and gouras are mostly trampled. A vivid example of this is the cave Novomuradymovskaya. The cave pearl placers in gouras contained in it (see Fig. 1) were taken “for memory” by tourists, although the cave pearls on the surface have no value and are ordinary chalk balls.

Currently, cave pearls have been preserved only in karst cavities that are difficult to pass through, their parts that are hardly visited and inaccessible. In order to avoid its removal by unorganized tourists, the author intentionally does not give the name of the karst cavities and their location, where the cave pearls are still preserved. The cavers find and enclose the location and formation of cave pearls in order to avoid unintentional destruction of the microforms of the underground relief with cave pearls.

It should be noted that cave pearls in karst cavities, which are experiencing aposcopic stage of development, are still being formed. Reliable information on the speed of its formation in the caves of the Southern Urals is not available today. According to M.M. Moiseev and V.V. Levitsky (2009) calcite pisoliths with a diameter of up to 1 cm in an abandoned mine working of the Belorechensky barite deposit (Adygea, Russia) were formed in 7-10 years.

Conclusions

Cave pearls in the karst cavities of the Southern Urals are a very rare mineral formation and require protection. Of all the investigated karst caves of the Southern Urals (958 pcs.), It was found in only 24 (2.5%).

In accordance with the conditions of formation, cave pearls are represented by three species that can be formed in the same microform of the topography of the bottom of the karst cavity.

The vast majority of karst cavities with cave pearl finds were formed in the West Ural speleological province in pure Devonian and Carboniferous limestones and are not typical of caves developed in metamorphosed car-

bonates of the ancient Riphean formations of the Central Ural speleological province. Almost all of them are of the Pre-Pleistocene age and are at the saproscopic stage of development.

Further study of cave pearls may clarify some features of the development of karst cavities.

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FEATURES OF THE CHEMICAL COMPOSITION OF GROUNDWATER IN THE EASTERN DONBASS, RUSSIA

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The main purpose of this research is to assess the quality of groundwater and the extent of its contamination in the Eastern Donbass. To achieve this goal, standard mathematical statistics and an original method of assessing water quality using the total pollution indicator are used. The leading drivers of environmental transformation in the region are the coal mining industries. Under the influence of these factor intensive pollution of groundwater are formed. The assessment of groundwater quality has been implemented in relation to the requirements of the United States, the European Union, the World Health Organization and the Russian Federation. The most intense groundwater pollution was observed in concentrations Fe and Mn, and in concentrations SO_4^{2-} , M, Be, Na^+ , Se. . Groundwater is classified as "Risk" and "Crisis" as drinking water and - as "Disaster" as fisheries water. The level of pollution of groundwater demonstrates the need to implement environmental rehabilitation measures and improve treatment technologies.

Keywords: groundwater, chemical composition, pollution indicator, Eastern Donbass

Introduction

The main determinant of the environment in the Eastern Donbass is the coal industry. Numerous active and abandoned coal mines, processing plants, rock dumps form such negative phenomena as a sharp decline in groundwater levels, man-made cracking of rocks, salinity of soils, deformation of buildings and structures [2, 4, 6, 8, 10]. After the mass elimination of coal mines in the region began processes of flooding of the territory, subsidence of the earth's surface, the release of "dead air" and the formation of powerful streams of pollution, of air, water and geological environment [3, 5].

The main source of groundwater pollution is mine water in the average composition of sulfate magnesium-sodium (table 1). Groundwater in the composition of sulphate magnesium-calcium-sodium, their mineralization is 1.66 times less mineralization of mine waters, but 2.65 times higher than clean groundwater, that is, they are subject to significant pollution.

Table 1
The average composition of mine and groundwater
(mg/l and %-mole)

Type of water	pH	HCO_3^-	SO_4^{2-}	Cl^-	Ca^{+2}	Mg^{+2}	Na^{+1}	Fe	M
Mine water	6,95	591	2837	347	293	267	966	33.7	5301
		12	76	12	17	28	55		
Groundwater	7,20	472	1511	333	325	152	437	3.17	3230
		16	65	19	33	27	40		
/Clean groundwater	7,63	289	267	288	102	40	230	0.05	1215
		26	30	44	28	18	54		

The main purpose of this research is to assess the quality of groundwater and the extent of its contamination. To achieve this goal, standard mathematical statistics and an original method of assessing water quality using the total pollution indicator are used.

Methodology

To characterize the chemical composition of mine and groundwater, standard methods of mathematical and statistical analysis of data (assessment of average arithmetic, median, minimum and maximum values, random deviation) are used. The main method of assessing water pollution is a widely used geochemistry and geoecology assessment of the extent of water pollution, soils, bottom precipitation, etc. by concentration ratio (K_{ic}) and total pollution indicator (Z_c). The categories of water and environmental pollution are used (table 2). For the "norm" category, where the concentrations of polluting components are lower than MAC, the total should be less than 2; further categories are set with a multiple of 8: $2 \cdot 8 = 16$, $16 \cdot 8 = 128$, etc. (table.2).

The i-component concentration ratio is calculated according to the following formula:

$$K_{ic} = C_i / C_{mac},$$

where the component's C_i -concentration, C_{mac} , is the maximum permis-

sible of the component.

The degree of water and environmental pollution by n components is estimated by the total pollution indicator:

$$Z_c = \sum_i K_{ic} - (n-1).$$

The categories of water pollution and the environment are listed in Table 2.

Table 2
Water and environmental pollution categories

Total pollution indicator	Water and environmental pollution categories
<2	Norm
≥2 - 16	Risk
≥16 - 128	Crisis
≥128 - 1024	Disaster
≥1024	The Great Disaster

The total pollution indicator makes it possible to assess the quality of the chemical composition of any type of water (atmospheric, surface, underground, man-made) relative to any regulatory indicators [3, 5].

In this paper, the MAC rules (table 3) are set for the following documents: for the Russia – in documents [7, 9]; for the United States: "U.S. Environmental Protection Agency (U.S.EPA); for the EU - EU directive "On the quality of drinking water intended for human consumption" 98/83/EU; for WHO - "1992. Drinking Water Quality Control Guide";

Table 3
MAC values

Component	MAC U.S. drinking	MAC EU drinking	MAC WHO drinking	MAC RF drinking	MAC RF Fisheries
pH	6.5-8.5	6.5-8.5	N	6-9	6-8.5
SO ₄ ⁻²	250	250	250	500	100
Cl ⁻¹	250	250	250	350	300
Na ⁺¹	N	N	200	200	120
Mg ⁺²	N	50	N	50	40
M	500	1500	1000	1000	1000
Al	0.2	0.2	0.2	0.2	0.04
Be	0.004	N	N	0.0002	0.0002

Fe	0.3	0.2	0.3	0.3	0.1
Cd	0.005	0.005	0.003	0.001	0.005
K	N	12	N	30	50
Co	N	N	N	0.1	0.01
Li	N	N	N	0.03	0.03
Cu	1.3	2.0	1.0	1	0.001
Mn	0.05	0.05	0.5	0.1	0.01
Ni	N	N	0.02	0.02	0.01
Pb	0.015	0.01	0.01	0.01	0.006
Se	0.05	0.01	0.01	0.01	0.002
Sr	N	N	3	7	2
Cr	0.1	0.05	0.05	0.05	0.05
Zn	5	5	3	1	0.01

Note. The "N" badge indicates that there is no information about the MAC.

Research results

Analysis of changes in the chemical composition of groundwater in the Eastern Donbass for 65 years (table 4) showed that the most significant changes began after the completion of the process of liquidation of coal mines in the region since 2005. The increase in groundwater mineralization almost doubled was mainly due to an increase in the concentration of SO_4^{2-} ion. This situation has arisen as a result of the development of intensive oxidation processes of sulphides and sulphur, enclosed in coals and rocks (up to 4-5% [1]) and further dissolution of sulfates. In the future, there is a gradual increase in the mineralization of the waters.

Table 4
Average groundwater composition (mg/l and %-mole)

Years	pH	HCO_3^{-1}	SO_4^{2-}	Cl^{-1}	Ca^{+2}	Mg^{+2}	Na^{+1}	M
1955	7.3	375	559	122	154	58	200	1368
		29	55	16	36	23	41	
1999	7.2	562	672	76	157	91	230	1510
		36	55	9	31	30	39	
2006	7.1	728	1362	108	282	110	461	2690
		28	65	7	33	21	46	
2010	7.2	542	1387	298	280	131	485	3029
		19	63	18	30	24	46	

2015	7.2	472	1567	333	325	152	437	3230
		16	65	19	33	27	40	

Table 5 shows the distribution of concentrations of groundwater macro components. Maximum concentrations are usually several times higher than average, and mineralization reaches 8.8 g/l.

Table 5
The chemical composition of groundwater (mg/l)

Component	X	X _{me}	X _{min}	X _{max}	S
pH	7.2	7,2	6.2	8.5	0,32
HCO ₃ ⁻¹	472	475	37	1244	153
SO ₄ ⁻²	1566	1551	30	5341	772
Cl ⁻¹	333	231	45	1690	259
Ca ⁺²	325	320	15	661	125
Mg ⁺²	152	146	26	377	66
Na ⁺¹	437	470	17	2435	290
M	3230	3248	1558	8756	1218

Note. X.- average arithmetic, Xme - median, Xmin and Xmax - minimum and maximum values, S - standard deviation.

The assessment of groundwater quality in the Eastern Donbass has been implemented in relation to the requirements of the United States, the European Union, the World Health Organization and the Russian Federation and is listed in Table 6.

Table 6
Assessment of groundwater quality

Component	X	Ki MAC USA	Ki MAC EU	K _i MAC WHO	Ki MAC RF Drinking	K _i MAC RF Fisheries
pH	7.2	0	0	N	0	0
SO ₄ ⁻²	1566	6.3	6.3	6.3	3.15	15.66
Cl ⁻¹	333	1.3	1.3	1.3	0.95	1.11
Na ⁺¹	437	N	N	2.18	2.185	3.64
Mg ⁺²	152	N	3.04	N	3.04	3.8
M	3230	6.46	3.15	3.23	3.23	3.23
Al	0.2	1	1	1	1	5
Be	0.0007	0.2	N	N	3.5	3.5

Fe	3.13	10.43	15.65	10.43	10.43	31.3
Cd	0.001	0.2	0.2	0.33	1	0.2
K	14.8	N	1.23	N	0.5	0.3
Co	0.002	N	H	N	0.02	0.2
Li	0.06	N	H	N	2	2
Cu	0.004	0.003	0.002	0.004	0.004	4
Mn	0.61	12.2	12.2	1.22	6..1	61
Ni	0.002	N	N	0.1	0.1	0.2
Pb	0.001	0.07	0.1	0.1	0.1	0.17
Se	0.016	0.32	1.6	1.6	1.6	8
Sr	3.1	N	N	1	0.44	1.55
Cr	0.002	0.02	0.04	0.04	0.04	0.04
Zn	0.08	0.02	0.02	0.03	0.08	8
Z _c		25.5	31.8	14.9	13.4	172.9

The total pollution indicator by USA and EU regulations has classified groundwater as a "crisis", according to WHO and Russian regulations, as a "risk"; according to the standard for fisheries waters, the category of "disaster" has been established. Consequently, the groundwater of the Eastern Donbass is characterized by a fairly high level of pollution.

The most intense groundwater pollution was observed in concentrations Fe and Mn, and in concentrations SO_4^{-2} , M, Be, Na^{+1} , Se.

Conclusion

Analysis of changes in the chemical composition of groundwater in the Eastern Donbass for 65 years showed that the most significant changes began after the completion of the process of liquidation of coal mines in the region. This situation has arisen as a result of the development of intensive oxidation processes of sulphides and sulphur, and further dissolution of sulfates.

The assessment of groundwater quality has been implemented in relation to the requirements of the United States, the European Union, the World Health Organization and the Russian Federation

Detailed analysis of the quality of the groundwater chemistry of the Eastern Donbass was carried out by determining the total pollution indicator. Groundwater is classified as "Risk" and "Crisis" as drinking water and - as "Disaster" as fisheries water.

The most intense groundwater pollution was observed in concentrations Fe and Mn, and in concentrations SO_4^{-2} , M, Be, Na^{+1} , Se.

The constant increase in groundwater pollution highlights the need for monitoring observations, environmental rehabilitation measures and improvements in treatment technologies in the region.

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**EFFICIENCY OF USING JERUSALEM ARTICHOKE (TOPINAMBUR)
PLANTS IN TECHNOLOGIES FOR THE PRODUCTION OF MEAT
PRODUCTS
FOR DIET FOOD**

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Development of the science of nutrition made it possible not only to determine the value of each substance, but also to establish their optimal balanced content in the human diet, depending on their gender, age, and working conditions. It is necessary to ensure the production of products balanced in chemical composition, in which the quantitative content of proteins, fats and carbohydrates is correctly combined. With a balanced food, the main food components must enter the body in a certain quantitative quantity.

Keywords: protein, supplements, jerusalem artichoke, topinambur, meat products, natural, collagen, raw materials.

Development of production and storage methods that provide higher quality product indicators requires the study and disclosure of the regular relationships between quality factors and product properties, the study of the relationship of various properties, food value and consumer advantages of the product, as well as the study of safety indicators microbiological and chemical.

To improve the quality of food products, it is important to control the

quality of raw materials, semi-finished products and finished products. The need for product quality control is associated with the growing complexity of production operations; increased requirements for the quality of meat products, expanding the range of food products, increasing the number of food additives in the composition of food products. In the production of dietary food products, quality control of raw materials and food additives is required upon acceptance for processing;

- maintaining appropriate storage conditions for raw materials;
- compliance with the formulation of products; the quality of the semi-finished products at the individual stages of the product manufacturing process;
- maintaining the appropriate sanitary condition of equipment, containers and industrial premises to prevent chemical and biological hazards;
- compliance with the technological regimes of production of products;
- compliance with the regimes and conditions of storage of products.

Enzymatic processes are the basis of modern technologies for the production of dietary meat products, the result of which is the formation of specific organoleptic properties, the nutritional value of the finished product.

One of the effective ways to improve the quality of dietary cooked and boiled-smoked beef sausages with a more stringent consistency is the fermentation process. Early studies have shown. That with the help of proteolytic enzymes of animal, plant and microbial origin, as well as own (natural) meat enzymes, it is possible to affect meat proteins. In order to improve the functional and technological properties of the feedstock and the structural and mechanical parameters of the finished product, a biotechnology for creating collagen ingredients was developed.

As an object for isolating the collagen fraction, we used waste veins of raw meat from beef, which has a high mass fraction (33.7%) of the total meat protein content, including alkali-soluble proteins (86.3%).

For biomodification of proteins of muscle and connective tissue, after washing, collagen-containing secondary raw materials were overcoming to mechanical processing-crushing on a top to a particle size of 2-3 mm. Then, mechanical processing was carried out in a cutter with ice. The obtained ingredients of collagen raw materials were achieving to biochemical treatment with the addition of a biological supplement based on a Jerusalem artichoke plant, after which complete fermentation of muscle and connective tissue with the formation of a sticky, smeared homogeneous mass occurs.

To determine the degree of degradation of collagen raw materials, the

moisture-binding and emulsifying ability was taken as a criterion of functionality. These indicators largely determine the quality and structure of cooked sausages. Given the high functionality of collagen proteins in the production of sausages and its medicinal properties, replacing 10-20% of minced meat with collagen protein of muscle and connective tissue of meat is appropriate, which increases the functionality of the finished product.

It is known that a significant number of the population suffers from serious diseases of the musculoskeletal system due to the destruction of connective tissue and cartilage of the joints, due to a deficiency of collagen proteins in diet. However, foreign companies make animal protein production in the form of powder. Due to their high commercial value and questionable composition of such powders, they do not inspire confidence in the use of our manufacturers.

Proposed process is a mechanical grinding of raw materials (homogenization), accompanied by the formation of a stable water-protein emulsion with certain rheological (stickiness, plasticity), technological (water binding ability) and organoleptic characteristics.

The essence of this technological scheme is that, by applying a food supplement from an ecologically clean Jerusalem artichoke plant, we can get high-quality meat products that have therapeutic preventive properties and enrich the finished product with protein, soluble carbohydrates, carotenoids, lipids, which have good digestibility.

Recommended to use the proposed fundamentally new technological scheme for the production of dietary meat products, in which this technology ensures digestibility, improving the quality of sausages (assortment of meat products), increasing the yield of finished products and improving organoleptic characteristics.

This technological scheme separately offers the preparation of a protein-fat emulsion using a food supplement containing powder from Jerusalem artichoke tubers. During the homogenization of raw materials, the morphological structure of tissues is destroyed, individual structural elements are broken up, soluble myofibrillar and sarcoplasmic proteins are extracted, their hydration and dissolution, fat dispersion, water binding, the formation of a protein structural matrix and, in fact, water-protein-fat (meat) emulsion, mixing, heating, etc.

The process of grinding raw materials and the formation of meat emulsion proceeds in three phases. In the first phase (during the first 2-3 minutes), mechanical destruction of the cellular structure of tissues predominates, muscle fibers are destroyed, their contents flow out.

There is an extraction of proteins in the aqueous phase (water: meat + and added water), and the efficiency of the process increases in the presence of sodium chloride. In the second phase, muscle proteins begin to swell intensely, bind water added to the meat system; there is a secondary structure formation of proteins among themselves and the formation of an emulsion matrix. The value of the water-binding ability of the system increases. Moreover, for the formation of the structure of the emulsion and its absorption of water, the degree of transition of myofibrillar proteins to the dissolved state is crucial, which is facilitating by the presence of sodium chloride and the high homogenization of the raw materials.

If insufficient grinding, the proteins do not completely leave the cell structure and do not participate in the binding of water and the formation of a spatial framework, which can lead to the separation of minced meat. In the third phase, with continued grinding of the raw material, partial dispersion of fat occurs (against the background of a local temperature increase during cutting) with the formation of finely divided fat globules, which combine with a protein framework consisting of water and salt-soluble muscle proteins, an emulsion is formed. Water-soluble proteins are able to emulsify 30 ml of fat per 100 g of protein, salt-soluble-40 ml.

With intensive grinding, adipose tissue is mainly dispersing in the form of solid particles with a size of 20-75 microns, consisting mainly of intact fat cells. At the same time, the structure of adipose tissue is partially destroying, and as a result, of which a fat drop flows from damaged cells.

In this regard, when the cells break down and the temperature rises, more and more fat is releasing and dispersing, which should be limiting and stabilizing in order to prevent the destruction of the emulsion and its subsequent isolation from the product.

Partial melting of the fat during cutting is also facilitating by local overheating of the raw materials in the cutting zone, which can be significantly higher than the total temperature of the emulsion. The size of emulsified particles of fat is from 10 to 0.1 microns and is characteristic of colloidal systems.

Molecules of dissolved proteins as surface-active substances are adsorbing from the continuous phase on the surface of crushed fat particles, unfolding hydrophobic groups to fat, hydrophilic to the aqueous phase.

An adsorption film forms around the fat particles, which keeps the fat in a dispersed state. As the minced meat is ground, the degree of dispersion and the total surface area of the fat particles increase, so a sufficient amount of the aqueous-protein phase is necessary for fat binding.

If the grinding is too strong, the amount of dissolved protein may become insufficient, and then part of the fat particles remains free, not cov-

ered with an emulsifier film.

The resulting of excessive temperature increase can cause partial denaturation and destruction of protein films, including from mechanical stress during grinding and stirring.

Thus, the amount of fat and water, as well as the degree of grinding of raw materials determine the required amount of soluble protein for the formation of a stable meat emulsion. The total grinding time should be sufficient to form a protein matrix surrounding the dispersed fat particles. Temperature control of raw materials is an important condition for obtaining a stable emulsion. With fine intensive grinding, the minced meat is heated and exceeding the level of 1800 C can lead to protein denaturation, which will cause a decrease in emulsifying and water-binding ability, the appearance of friability, broth and fat swelling in the finished product. To prevent overheating of meat emulsions, it is necessary to control the cutting time (no more than 7-11 minutes), temperature (should be in the range from 10 to 1500 C), the quality of the sharpening of the cutting organ. The temperature is reducing by introducing cold water, ice or snow into the emulsion. As you know, protein extraction during grinding of muscle tissue in the presence of water and sodium chloride most effectively occurs at temperatures close to -200 C.

Based on experimental studies, a technological scheme for the production of dietary meat products was developed (Fig. 1).

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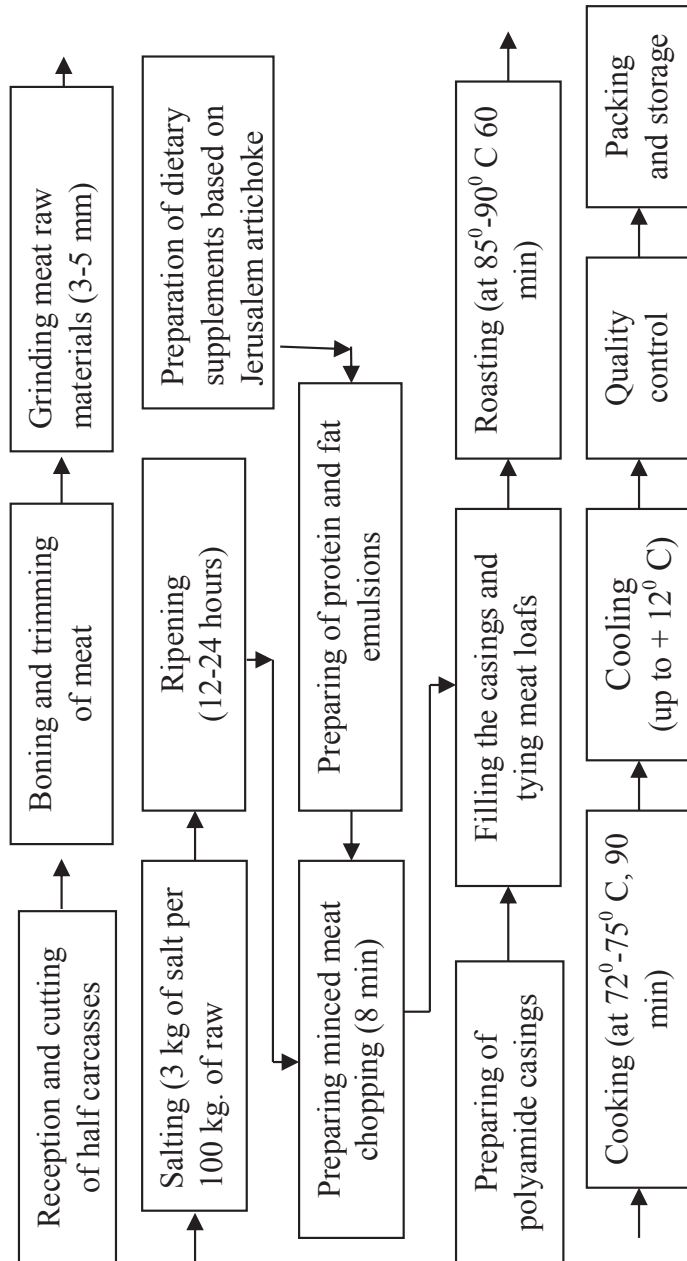


Figure 1. The technological scheme of the production of dietary meat products.

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