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ECONOMICS

STRATEGIES OF INNOVATIVE DEVELOPMENT OF HOTEL BUSINESS IN THE CONVENTION OF THE COVID PANDEMIC 19

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Annotation. *The analysis of technologies of innovative products that use the enterprises of hotel business during the pandemic of Covid19 is carried out. The classification of applied strategies of innovative development is considered. Approaches to the interpretation of innovation development strategies are studied. Innovative products that are introduced into the activities of hotels during quarantine restrictions have been identified. The strategic map for definition of an innovative direction of activity of the enterprises of hotel business is offered.*

Keywords: *hotels, innovations, strategies, strategic map, innovative product, covid pandemics 19.*

Actuality. In the context of the global economic instability caused by the Covid-19 pandemic, hotel businesses need to adapt to the current realities of operation both during and after the crisis.

Currently, the current situation in the hotel business market is negative for the hotel business. Thus, according to the WTO [10], in the first quarter of 2020 there was already a reduction in travel by 22%, and arrivals in March fell to 57% in all markets. That means a loss of 67 million international tourists and about \$ 80 billion in revenue. Under these conditions, the ability to maintain the growth potential demonstrated by the hotel business in the pre-crisis period of the crisis is determined by the ability of enterprises to form innovations as sources of business process transformation.

The peculiarity of the introduction of innovations in the hotel industry is not only to increase efficiency and improve working conditions, but also to ensure comfort and maximum satisfaction of various consumer needs.

Research of features of formation and introduction of strategies of innovative development is considered in scientific works, both domestic, and foreign scientists among which it is necessary to separate: A. Agibalov [1], M. Bosovskaya [1], A. Grechan. [3], M Kulik [5], O. Laburtseva. [6], A. Mazaraki [8], T. Melnyk. [8], S. Melnichenko. [1,7],

O. Poltava [5], L. Romanchuk [5], O. Shatilo [3], L. Yatsyshyna [6] and many other scientists. Authors: A. Mazaraki, T. Melnik [8] in their works noted that the application of innovation strategy provides prerequisites for the development of hotel business and form a reliable competitive position in the hospitality market. Authors: A. Agibalov, M. Bosovskaya, S. Melnichenko [1] - define an innovative approach to assessing the quality of hotel services; M. Kulyk, O. Poltavska., L. Romanchuk [5] - installed innovative tools in managing consumer behavior. The question of methods of stimulating innovative activity in the conditions of sustainable development is paid attention in the works of Grechan AP, Shatilo OV [3]. and Laburtseva OI, Yatsyshyna LK [6]; Okhrimenko O [9] - the western organization of production and innovation activity is investigated. After all, the possibility of using innovation technologies during a pandemic is not taken into account.

The works of such scientists as Bovsh L. [2], L. Hopkalo [2], Yu. Gorbenko [7], George G. [4], I. Komarnytsky [2], Lahani K. [4], Litvyshko L. [7], Puranam P. [4] and others. The substantiation of the state of enterprises in the challenges of the Covid19 pandemic is determined in the works of L. Bovsh, L. Hopkalo [2] and L.O. Litvyshko, Yu.A. Gorbenko [7]. By research of management technologies and innovations in quarantine limitations of enterprises is George G., Lahani K. and Puranam P [4]. Exactly an innovative question in the sector of hospitality under act of pandemic crisis is spare not enough attention. Although understanding on the modern stage of quarantine influence of pandemic of Covid 19 for the enterprises of hotel business is actual enough and needs the additional study of methodical principles of forming and realization of innovative strategies.

The purpose of this work is to study the theoretical foundations of the formation and implementation in the hotel business of the strategy of innovative development

A set of complementary research methods was used to solve the tasks: analysis of documents, scientific publications from 2011 to 2020, periodicals, Internet portals on the activities of hotel enterprises; definition and formation of a modern model of enterprise perception of organizational and managerial innovations.

The market environment of Ukraine is undergoing constant critical changes under the influence of the David 19 pandemic. At the same time, competition is becoming more global and, accordingly, business needs adequate dynamic development. Its main directions are based on the latest innovative technologies. Therefore, the adaptability of enterprise strategies to innovation remains the only key factor in survival and development in a global competitive environment.

Innovative processes are an integral feature of modern business, which helps to survive in post-war conditions. The strategic approach to the development of enterprises allows to respond in time to new market needs and the need for appropriate changes, allows you to choose the innovation, the introduction of which will give an advantage in the market and thus effectively change the company and ensure social impact in the future.

Sources of classification of innovations are the features of the external environment

for innovation, the origin, nature and life cycle of innovation, management, and the effects of innovation on the external environment. In the economic literature there are various approaches to the classification of innovations (Table 1).

Table 1

Types of innovation development strategies

Author	Types of innovation strategies
O. Vodachkova	The main types: active offensive, moderately offensive, defensive and residual.
H. Freeman	Offensive, defensive, imitative, dependent, traditional and "on occasion".
B. Fishman	Independent production of innovations, "fast second", "lag with minimal costs", "filling gaps".
B. Santo	Traditional, imitation, defensive, opportunistic, offensive, dependent.
R. Fatkhutdinov	Violent (power), patient (niche), switching (adaptation strategy) and explanatory (pioneering).

Source: generated by the author [1,3,5]

That is, based on the strategic definition of the conceptual apparatus of innovative development is the idea that they are based on certain features of use. As the hotel business is currently suffering from quarantine restrictions, there is a direct struggle for each client. At present, the study of strategic innovative thinking should focus on aspects that reflect the diversity of business manifestations to identify consumer demands (Table 2).

Table 2

Classification of approaches to the interpretation of innovation development strategies

Author	Classification features	Treatment
S. D. Anthony, M. Eyring and L. Gibson	"Innovation Game Plan"	The key to success is subversive innovation. In order to regularly create successful innovative products, it is necessary to understand what customer needs are not yet met, and to study the proposals that have been successful.
L. Faye., R. Rendel	"Innovation Development Strategies"	Identification and satisfaction of hidden needs, new answers to the old request; complete conversion.
Kim Chan	"Blue Ocean Strategy"	An entity must create its own product or service, fill in the gaps that are empty, and be unique, unquestionable survival.
G. Mintzberg	"Five P strategies"	The five P strategies are interrelated, none of them can be considered the only true ones, these definitions are independent, but each of them is impossible without the rest.

Source: generated by the author [3,5,8,9]

Having considered in detail the classifier features of innovation processes and the significant range of their inflation on enterprises, it is necessary to understand how the

process of formation of modern innovations takes place.

The development of an innovation strategy involves its formalization in the form of an innovation program. Thus the purposes, tasks, procedures within the limits of the innovative projects included in the program have to be established. Resources and time constraints should be identified, both for individual innovation projects and for the entire innovation program, to ensure the organizational implementation of the program, it is necessary to form an organizational structure of innovation management and "embed" it in the organizational structure of the overall management of the enterprise, to create a system of external communications with partners, consumers and other stakeholders.

Designing an innovation strategy is a continuous, dynamic process based on the choice of a potentially successful strategic position of the enterprise. This choice should be a comparative analysis of alternatives by matching the needs of customers and capabilities of the enterprise to meet them. And it is strategic innovation that plays a very important role in the formation of such a strategic position in which the company can expand its market share or create new markets.

The implementation of innovative activities should take place in several stages, which will allow the company to achieve the desired result with minimal costs and losses, as well as to develop innovative strategies to improve the efficiency and completeness of management. The stages that the company will go through from the beginning to the end of the innovation project must be logically connected and form a comprehensive system of connections.

Planning - determining the goals and objectives of innovation on the basis of current and future plans for enterprise development, marketing and financial strategies.

Organization - choice of tools for implementing innovation, determining sources of funding and their structure, coordination of deadlines.

Management - personnel selection, division of functional responsibilities.

Motivation - use incentives to optimize the process of innovation.

Control - comparison of the obtained results with the planned ones (control of finances, technical quality characteristics, etc.).

However, the most widespread model of SWOT - analysis, the advantages of which are the simultaneous consideration of external and internal factors of development. In addition, the model allows, based on a study of the strengths and weaknesses of the enterprise, taking into account the impact of the external environment to identify strategic directions for further development, as well as possible threats.

Innovation strategy may involve the implementation of both a portfolio of innovation projects and individual innovation projects

The above classification scheme shows that innovations are diverse and different in nature, therefore, the forms of their organization, scale and ways of influencing innovation also differ. So in quarantine conditions in the struggle for the client, for a new segment of consumers, hotel companies use the strategy of an innovative product, creating a radically new hotel product. Schematically, all innovative practices are presented in Figure 1.

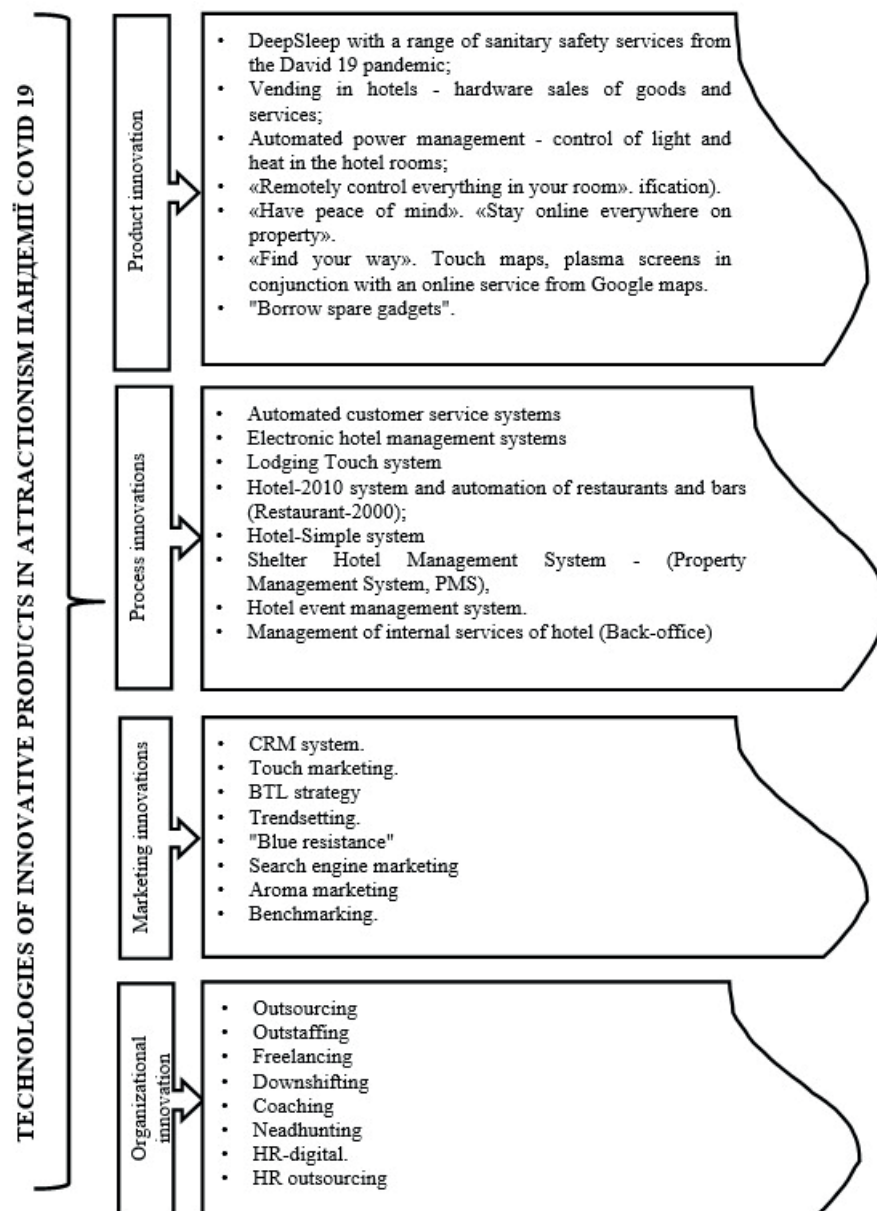


Fig. 1. Technology of innovative products attraction pandemic Covid 19

Source: author's development

All these technologies of innovative products in the attraction of the pandemic Covid 19 have a very powerful impact on the modern struggle of the hotel business. This requires hotels in the conditions of existence of the restructuring of the organization

of service provision (new technologies), the use of automation of registration and contactless customer service. Today, most of them are based on modern information and communication technologies and robotics. Timely and accurate use of tactical approaches to marketing innovations in the hotel business is based on the latest distribution techniques, advertising methods or pricing strategy, which is currently a prerequisite for the stabilization of the hotel business during the pandemic.

Product innovations include the use of new materials, new semi-finished products and components; receiving fundamentally new services. In the struggle for a new customer, for a new segment of consumers, hotel companies use the strategy of an innovative product, creating a radically new, having analogues.

The product innovations include many developments:

- Rooms specifically for sleep (Deep Sleep) with a set of services that promote relaxation and falling asleep;
- Vending in hotels - hardware sales of goods and services;
- Automated power management - control of light and heat in the hotel rooms;
- «Remotely control everything in your room». Guest gadgets that are integrated into the electronic management of the hotel;
- RFID (Radio Frequency Identification). Door lock with radio frequency identification, in the presence of which the guest enters the room and other rooms of the hotel without a key;
- «Have peace of mind». An innovative security system that is able to independently determine the degree of threat to guests or employees.
- «Stay online everywhere on property». Online 24 hours a day, 7 days a week, 365 days a year.
- «Find your way». Touch cards for the convenience of guests. For example, the use of touch, plasma screens in conjunction with an online service from Google maps.
- "Borrow spare gadgets". Rent of modern devices in hotels.
- it is the use of hypoallergic
- bed linen; it is the use of facilities without a chlorine;
- it is the use of ecological materials in the design of hotel, planting of greenery of territory.

Process innovations mean new methods of organizing the provision of services (new technologies), such as automation of registration and customer service. Today, most of them are based on modern information and communication technologies.

- Automated customer service systems simplify the process of registering visitors, interacting with maids, ordering restaurant service, etc.

- Electronic hotel management systems are reliable assistants to the hospitality industry. Now the hotel employee can get all the necessary information by connecting to the appropriate web service.

- Lodging Touch system - improves the quality of guest service, automates administrative, marketing, financial, economic and economic activities of hotels and hotel complexes, as well as boarding houses, rest homes, sanatoriums and motels;

- Hotel-2010 system - designed for hotels with any number of rooms. The system has a modular structure and consists of subsystems for automation of hotel functions (Hotel-2010) and automation of restaurants and bars (Restaurant-2000);

- Hotel-Simple system - to automate the activities of hotels, works in a local area network with a dedicated or non-dedicated server

- Hotel management system "UCS Shelter" is a hotel management system (Property Management System, PMS), which allows not only to book a room, simplify the procedure of registration of the guest taking into account his preferences, but also to plan the loading of the hotel.

- Hotel event management system. With this technology you can plan to load different rooms of the hotel - its conference rooms, restaurants, banquet halls.

- The system of management of internal services of hotel (Back-office) allows the personnel to access data: what number needs to be cleaned, what needs to be repaired, to take into account, special wishes of visitors.

- The marketing innovations of a hotel enterprise are tied to the implementation of changes related to the total consumption of a service or product, as well as their distribution, methods of advertising or pricing strategy.

Among the innovations of the hotel business it is necessary to highlight the main marketing trends:

- CRM system. The system performs one of the tasks of marketing - systematization of data about the consumer of the company's products. Providing effective management of the contact base, a system of this type helps to obtain competitive advantages in the market.

- Touch marketing. Touch marketing - a type of marketing, the main task of which is to influence the feelings of customers, their emotional state in order to increase sales.

- The use of certain musical design and special flavors can be part of another marketing innovation in the hotel business: branding - a set of successive measures aimed at creating a holistic and in-demand image of the product or service [2];

- BTL-strategy - a strategy of the hotel, which provides targeted activities to influence the consumer at the time of the decision to purchase the service (promotions, sampling, demonstrations, discounts, bonuses).

- Trendsetting - promising modern marketing technologies to meet the needs and demands of target groups of customers, which provide not just imitation, but the creation and implementation of the latest trends in the hotel business market.

- "Blue resistance". The concept includes a set of measures to save costs, effective planning, increase the level of service, reorientation in favor of environmental technologies.

- Search marketing (Search engine marketing) - a set of measures aimed at increasing site traffic to its target audience with the help of search engines.

- Aroma marketing - a way to attract customers and increase loyalty by distributing special flavors in hotels. The technologies used include aerosol aromatization, wax aromatization, aroma oils, etc.

- Benchmarking. Develops competitiveness analysis, limited to the study of competitors' products, costs and technologies, characteristics, economic and financial indicators

Organizational can be called innovations that introduce the latest methods of attracting staff and ensure their work in the hotel.

- outsourcing (from the English. Outsource, which means the transfer of certain functions of the company, a third-party organization that has the capacity and staff to implement these functions)

- outstaffing (from the English outstaff, which means the withdrawal of staff from the staff of the customer company and its registration in the staff of the provider company).

- freelancing is a productive activity of people of different professions (lawyers, doctors, psychologists, business consultants, trainers, sales agents, marketers, programmers, journalists, etc.).

- downshifting - the transition from a job for which many are paid, but associated with constant stress, overload, which takes a lot of free time, to a quieter, albeit with a lower level of earnings.

- coaching - an effective innovative tool in the practice of professional development of management potential of the enterprise. Western personnel consider coaching to be the most effective method of realizing the hidden professional and business potential of a person (employee).

- headhunting This method is based on the understanding that valuable employees, top-level professionals, almost never think about changing jobs and, accordingly, are not in active search.

- New trend of 2018 - HR-digital. This is not only an automated method of recruitment, but also the creation of a new concept of thinking, new approaches to work and interaction with potential and actual employees of the company.

- HR outsourcing is a special method of recruitment that is highly efficient. The process of working with an outsourcing company is different from working with a recruitment agency.

All these classifications of innovations have a very strong influence on the struggle of the enterprise among other opponents in the services market. Timely and accurate use of tactical approaches to business organization, will achieve the palm of supremacy in the rankings, national statistics, as well as attract many consumers of hospitality services.

Based on the definition of the main priority technologies of innovative products during a pandemic, it becomes necessary to form a strategic map. This map will help to determine the stages and direction of choosing an innovative strategy of the hotel business Figure 2.

Thus, the strategic map is an applied representation of the strategy of innovative development and the definition of how integrated and combined goals of the enterprise are transformed into a single strategy. The inclusion of this component in the stages of formation of the innovation strategy will increase the efficiency of the use of financial support for innovation, as the management of the enterprise will form an action plan

under different conditions of strategic activity.

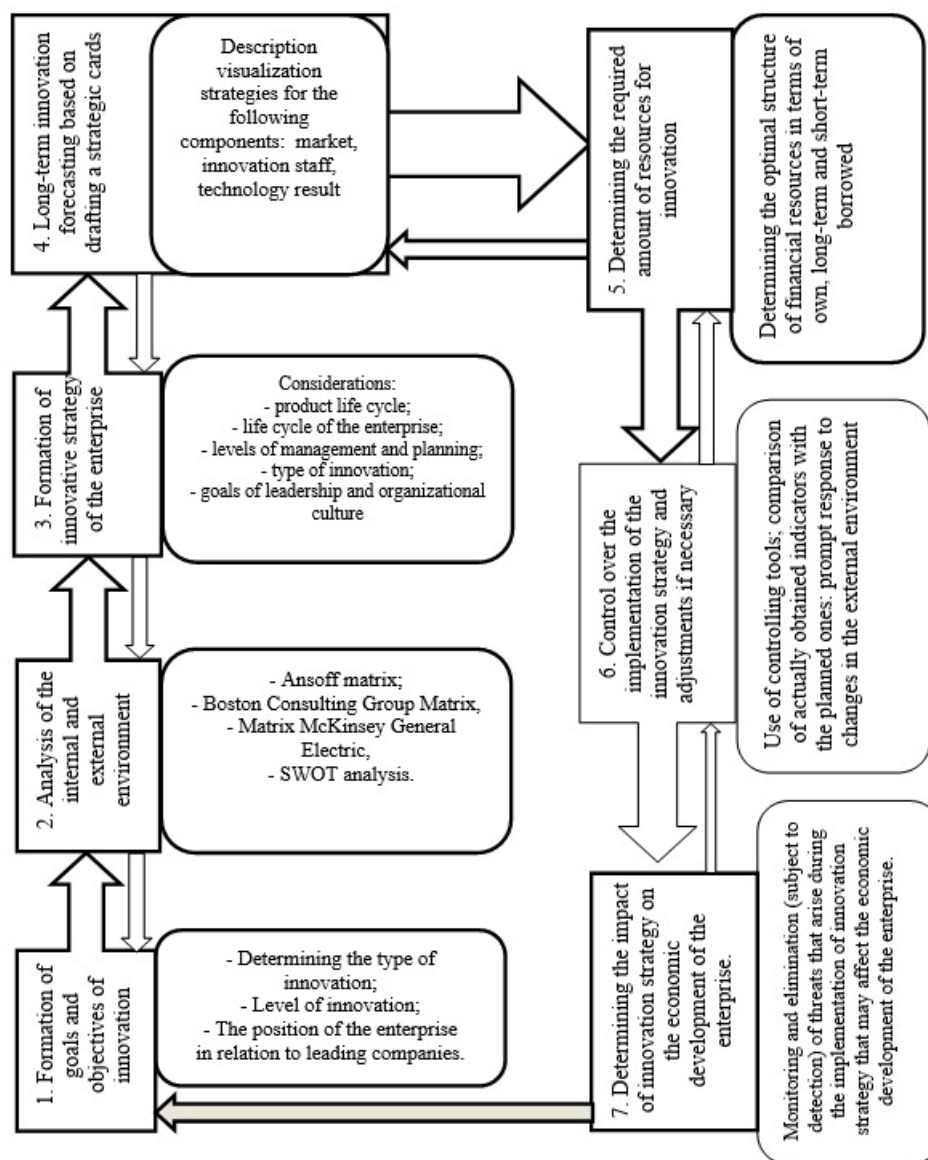


Fig. 2. Strategic map - stages of development of innovation development strategy.

Source: author's development

The inclusion of this component in the stages of formation of the innovation strategy will increase the efficiency of the use of financial support for innovation, as the management of the enterprise will form an action plan under different conditions of strategic activity.

The process of developing a strategy for innovative development of the hotel business is a series of successive measures with the mandatory presence of feedback, allowing the adjustment of goals and objectives, to form the final indicators. Consider this process step by step.

Basic developments of strategies are on the enterprises of hotel business.

1. Formation of strategic goals and principles of innovative development of the hotel enterprise. At this stage, the effectiveness of an innovation is evaluated in terms of the possibility of creating a product, service or process with improved or qualitatively new characteristics; variants of using innovations in activity are considered, the time of entering the market is determined (ie the risk of non-acceptance of innovation by the market is taken into account), the level of investments is calculated, and so on.

2. Comprehensive analysis of the current economic and innovative state of the hotel enterprise, as a result of which the readiness of the accommodation facility for innovations is assessed. Analysis of the internal and external environment of the enterprise, assessment of the impact of macro- and micro-environmental factors directly on the innovative development of the hotel.

3. Development of measures to change the innovative state of the enterprise (introduction of innovation), determine the qualitative and quantitative indicators of these changes, resulting in the formation of a business plan for innovative development of the hotel enterprise.

4. Creating a business plan for innovative development, which provides an analysis of possible alternatives and a system of plans that will respond effectively to changes, opportunities and threats, to mutually coordinate the chosen strategy with other functional elements, to make the necessary adjustments.

5. Forecast of the result of innovative activity. The calculation of forecast economic indicators of accommodation facilities is carried out taking into account the implementation of planned measures for the introduction of innovation. Possible deviations are identified and measures are taken to eliminate them.

6. Implementation of the strategy of innovative development of the hospitality enterprise, in the process of which the activity is constantly monitored: compliance with plans and tasks is monitored, achieved results are evaluated, necessary adjustments are made, the level of satisfaction of consumer demands is revealed.

The requirements for a successful innovation strategy are as follows: it must contain clear directives and timeframes, be flexible, be supported by organizational design and correlate with the overall corporate strategy. The key to the success of an innovation strategy is its constant improvement.

The formation of innovation strategy is based on solving a number of answer questions, which are based on conceptual principles - implicit ideas about the values of different types of innovation for the company.

The directions of further development of hotel enterprises should be determined through the prism of their ability to adapt to the requirements of the external environment. Therefore, the main content of the formation of the strategy for the development of

hotel enterprises is to identify promising areas of economic activity based on constant monitoring of the business environment, organic mastery of strategic thinking and management methods designed for the future.

Conclusions. The study showed that the strategy of innovative development is inherent in the modern management of the hotel business. Influence of pandemic of Covid 19 resulted in determination of basic innovative products that is used by the enterprises of hotel business.

Currently used: product innovation that has completely changed the service of consumers of hospitality services and made it contactless; process innovations - improved automation and management of all business processes of the hotel; marketing innovation has led to the use of the latest marketing techniques to attract a larger audience of consumers (visuals, kenistet, digital, audio); organizational innovations - allow to form professional teamwork of hotel staff in difficult pandemic conditions. This application of the above technologies of the innovative product provided the basis for the formation of a strategic map. It will allow to systematize use of these innovative products and to build stages of their application.

This approach to the application of innovation development strategy will enable the hotel business to emerge from the pandemic crisis and adapt their activities to modern realities.

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INNOVATIVE ACTIVITY AS A BASIS FOR IMPROVING COMPETITIVENESS OF THE HOTEL BUSINESS

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Annotation. *The main directions of increase of competitive advantages of hotel enterprises are investigated in the article. The directions of improving the quality of service in hotels and maintaining them at a consistently high level are considered. The use of innovations in the hotel industry provides an opportunity to improve the quality of service and improve the efficiency of both individual departments and the hotel as a whole.*

Keywords: *innovations, hotel enterprises, innovation activity, efficiency, competitiveness, hotel services.*

Actuality of theme. Hotel enterprises in modern conditions operate in an environment of multidimensional competition, in which efficient management depends on the timely implementation of innovations. The growth of competition in the hotel industry requires the use of innovative methods of personnel management, material resources, information, the introduction of infrastructural, technological and other innovations in the activities of hotel enterprises. However, the domestic market for the services of such accommodation facilities is still in the process of formation. Therefore, it is relevant to identify the features of the popularization of conceptual hotels in the hotel services market in today's conditions, as well as determine their place among other types of accommodation facilities. The popularity of conceptual hotels encourages many owners of "classic" accommodation establishments to change the concept and work in a new segment of the hotel services market both abroad and in Ukraine.

Analysis of recent research. The influence of innovations on the efficiency of hotel enterprises in their works was considered by such authors as Balabanov I.T., Zabaldina Yu.B., Anipin V.M., Boyko M.G., Danilchenko I.V., Ildemenov S.V., Zavlin P.N., Ilyenkova S.D., M. However, the hotel business is constantly evolving and uses new management methods and service technologies in the accommodation sector to attract tourists. Therefore, the importance of innovation in the hotel industry of the world is relevant for our country too.

The purpose of the article is to determine the features of the introduction of innovation in the field of hotel services, to study the main directions and factors that affect the innovative activities of hotel enterprises.

Setting objectives. In conditions of increased demand for hotel services for different categories of tourists, there is a growing need to study innovative development in terms of organizing innovation processes within the enterprise, substantiation of novelty

criteria in the implementation of innovative projects in hotels of different categories, the formation and use of investment resources. The hotel services market is becoming more diverse every day. Therefore, the problem of introducing innovative ideas into the hotel business in our time is very relevant. Consumers now have a wide range of accommodation services, ranging from design to unique additional services. Therefore, hospitality actors should always monitor both innovations and modern technologies, as well as the possible desires and needs of consumers.

Follow-up to international standards is mandatory. Systematic development allows Ukrainian hotels to become more successful and attractive to guests, including foreign ones. This will positively affect the development of tourism in Ukraine. Today, the hotel industry is an important part of tourism, the positive activities of which can boost the economy and raise the image in the international arena.

Innovative technologies in the hotel industry are one of the key success factors for enterprises in this field, create the necessary conditions for sustainable development of hotel enterprises, aimed at ensuring the competitiveness of services provided at the level of international standards.

Due to the large number of competitors in the market, each hotel should have its own face, a unique feature that distinguishes it from others and makes it unique. For this reason, hotel operators create brands that complement specific artistic compositions, spectacular artificial lighting, decorative techniques, introduce innovative additional services, thereby spreading the idea of a conceptual project.

One of the current trends in the development of hospitality is the deepening of the specialization of the hotel business, various types of accommodation, which focus on serving certain segments of consumers. They form the main characteristics of a particular type of hotel business: concept hotels. To satisfy the wishes of tourists who need a higher level of comfort and are looking for new experiences, so-called "concept hotels" are being created, which are becoming increasingly popular in the world.

The introduction of innovative activities ultimately involves ensuring the appropriate effect. Depending on the purpose, innovations are aimed at increasing production efficiency, improving working conditions, increasing its productivity, competitiveness, etc.

Today, it is possible to track the dependence of the country's economic development on the scale and degree of innovation. Innovations at hotel enterprises are competitive hotel services, technologies, as well as marketing and organizational and managerial activities that increase the level of service. Constant innovation in the process of providing hotel services is a prerequisite for the development or even survival of the enterprise in conditions of fierce competition. An important responsible task for hotels is to create a reputation for high quality service. High quality guest service is ensured by the collective efforts of employees of all hotel services, constant and effective control by the administration, work to improve forms and methods of service, study and implementation of best practices, new equipment and technologies, expanding the range and improving the quality of services.

Management innovations include: new methods, styles, forms, methods of enterprise management. Easy access to information is a factor that leads to rapid copying of competitors innovations in management. In such a situation, you can win only if you constantly use an innovative approach to management. Management innovations are the basis of the constant process of improving the management system as a whole and a necessary condition for the development of the hotel business. In accordance with the dynamically changing conditions of activity, each hotel enterprise as a full-fledged market participant will have to change and become the initiator of internal organizational innovation processes. Innovations in the hotel business are cost-effective and efficient if they bring additional income, provide competitive advantages in the market, increase market share, reduce costs, improve the service process, increase the efficiency of individual departments and in general. There are four types of innovations that take place in the hotel business: product, marketing, resource and organizational (Fig. 1).

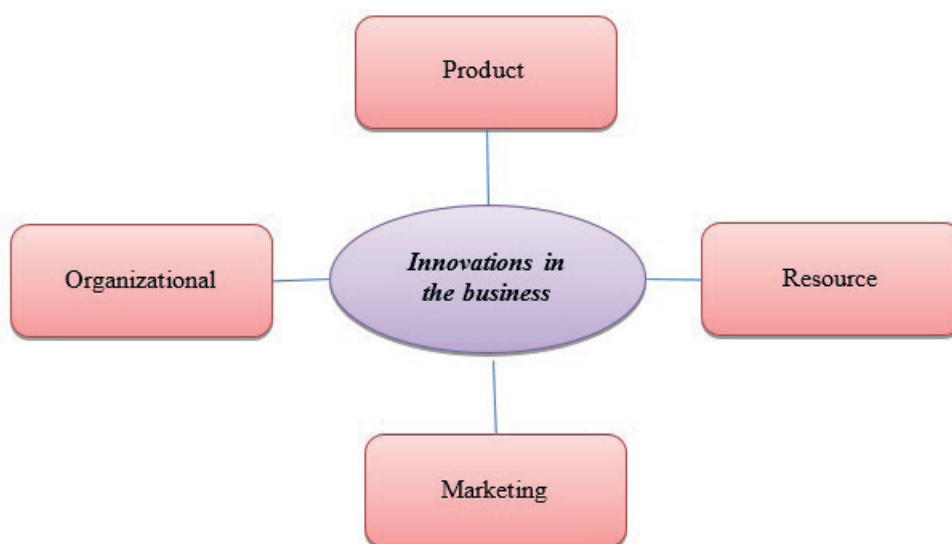


Fig. 1. Types of innovations in the hotel business

The innovation process is considered from different positions and with different levels of detail. First, as a parallel and consistent implementation of research, scientific and technical, production activities and marketing. Secondly, as stages of the life cycle of innovation from the emergence of the idea to its development and dissemination. Third, as the process of investing and financing the development and distribution of a new type of product or service. That is, the innovation process means the process of creating, implementing and disseminating innovations. The main essence of innovation is change, which is considered as a source of income.

In conditions of fierce competition, hotels are forced to look for new ways to increase the attractiveness and accessibility of their services. Underestimation of innovative

management in the activities of domestic hotel enterprises has led to a decrease in their competitiveness, violation of the principles and methods of management, reducing the quality of hotel services. Innovations act as a stimulus for the development of the hotel business, allow companies not only to occupy leading positions in their market segments, but also to meet global standards of hotel services [3].

It is this category that determines the ability of hotel enterprises to operate not only in the current financial, economic and political conditions, but also in the financial and economic crisis. Therefore, competitiveness management is very necessary and involves a set of actions for the systematic improvement of services, the constant search for new types of advertising, more modern groups of potential customers, improving the quality of services provided and more.

Innovation is an extremely complex process and depends on a variety of external conditions, as well as on the goal to which it is aimed. An example of the industry's activity is the improvement of hotel infrastructure due to the holding of the Euro 2012 championship in the country. An example of the activity of an individual enterprise is the introduction of additional services for servicing mass events such as gala events. Despite such diversity and variety of work, the function of change is the main function of innovation.

Among the priority areas of innovation development in Ukraine, which are defined by the Law of Ukraine "On Priority Areas of Innovation Activity in Ukraine", we can mention those that will be reflected in the hotel industry. This means that the following means of accommodation are no less than other sectors of the economy in need of activity and development on an innovative basis. In this regard, the objective need to develop, promote and implement, as well as implement a set of measures to improve the innovation of hotels.

As of January 1, 2019, more than 20,368 business entities are registered in the hotel and restaurant business, which is 1.71% of the total number of registered USREOU entities, including 19,389 with legal status, and 2,209 - physical persons - entrepreneurs. According to the State Statistics Service, back in 2016, hotel and restaurant businesses in Ukraine were unprofitable, and since 2017, business has improved and positive dynamics began to follow.

In recent years, significant competition for the hotel industry, namely, large hotels, are individuals - businesses that mainly maintain mini-hotels or own private houses and apartments, the number of which has been growing rapidly in recent years. They offer visitors at a lower cost a complete list of basic and additional hotel services.

In 2019, the hotel market of Ukraine was replenished with two new traditional hotels with a total of 110 rooms. At the same time, the development of hybrid hotels and concept hostels is more and more popular. In Kyiv in 2019, several original facilities were opened, as well as the world's first hostel in the former subway cars in Podil. The number of hotels in the capital increased during 2019 by only 110 rooms. After the reconstruction, the boutique hotel Riviera House (65 rooms) and the second building Amarant Hotel 3 * (45 rooms) were put into operation.

The use of innovative technologies in the hotel business is due to the rapid development of the market, market relations, fierce competition, changing demand, supply and whims of consumers of hotel services.

The use of software products for end-to-end automation of all business processes of the hotel today is not just a matter of leadership and competitive advantage, but also survival in the market in the near future. For fast and error-free control of operations of full analysis of the existing situation, speed and completeness of guest service at the reception, ie to ensure high economic efficiency and high quality of services, the introduction of automated control information systems becomes inevitable and indispensable.

The hotel industry can use a variety of computer technologies, from specialized software products for hotel management to the use of global computer networks. Today, the hotel industry uses a lot of the latest information technologies: global computer reservation systems, integrated communication networks, multimedia systems, management information systems, etc. Modern information technologies have the greatest influence on the promotion of the hotel product.

The introduction of innovative technologies in the hotel industry includes three stages.

1. Automation of business processes inside the hotel. Information about the hotel is accumulated and stored on the server.

2. Creating an internal information system. Allows you to automate business processes via the Internet, which connects the internal information system of the hotel with its external partners (tour operators, customers).

3. Combining the Internet and external systems into one business environment. Integrates all internal services of the hotel and provides response to any requests from the outside thanks to the methods of electronic data exchange, e-commerce.

The activities of hotel enterprises are aimed at increasing the number of guests with their subsequent transformation into regular visitors, which, in turn, is impossible without the modernization of technologies in customer service and requires saving time and energy.

Today high-tech processes are:

- the newest Grow panels which fasten on the outside of a facade and accumulate energy of the sun and wind;
- silent electronic doorbells using an infrared scanner that detects movement;
- Apple's iPhone, which allows a guest to enter their room, call the concierge, use the Internet and view pre-downloaded travel information;
- 24-inch iMac, which serves as an "entertainment center";
- shaving mirror that does not mist;
- an internal Pod Community Blog, organized by the hotel, is open to those who have booked a room and allows guests to share information.

One of the brightest examples of the use of innovative technologies in its activities is the Premier Hotel Rus hotel, which is located in the very center of business and tourist

districts of Kyiv. The hotel is oriented for business tourists in order to organize business meetings, has high-tech equipment of conference rooms of various configurations. Hypoallergenic bed linen is provided. He has an international Green Key certificate. He was one of the first in Kyiv to introduce "green" loyalty programs for guests and installed a charging station for electric cars on its territory. There is no charge for this service for hotel guests, and other drivers pay only for parking [1].

The innovations that have emerged as a result of scientific and technological progress are the use of Teleports by the Marriott hotel chain. Framestore, known for its visual effects design, was involved in creating the innovative technology. Glass booths have been set up on a New York City street for the purpose of a large-scale marketing campaign. With their help, guests can move anywhere in the world and directly to the accommodation. They are instantly located in the lobby of the Marriott Hotel, in the hotel rooms, on the azure coast or on the volcanic islands.

It is the client at this stage sets the vector of hotel business development and pushes hoteliers and developers to experiment. Many of them do not dare to do so, and in vain. In order not to lose and attract customers in difficult times, the hotel management's efforts are important to focus on finding new sales channels, launching additional loyalty programs, improving the quality of services.

Guests are attracted not by the "meters", but by the impressions and experiences they can gain while staying at the hotel. Therefore, such factors as unique location, impressive architecture, non-standard design, connection with local culture and immersion in the life of the city become important.

Conclusions. Development of hotels and increase of their attractiveness is impossible without use of innovations in the activity and introduction of the newest services. Constant self-improvement, determination and generation of new ideas allows companies to become market leaders and best meet the needs of modern consumers of hotel services.

Prerequisite for ensuring the competitiveness of the hotel industry of Ukraine is the intensification of innovation and the development of an appropriate innovation strategy. It should be based on the novelty of services, improving the manufacturability of their provision, economic and social efficiency.

The development strategy of the accommodation facility largely depends on the composition of the various functions in accordance with the implementation of the relevant components of the innovation life cycle. There is no single strategy for all hotel enterprises. Each hotel is unique, and, consequently, the definition of its innovation development strategy must also be specific and original. The strategy depends on the position of the placement on the market, its potential, the dynamics of development, the behavior of competitors, the social environment and many other factors.

Namely, the competitive advantage of the hotel is the basis of its successful operation in the market. The hotel industry is an important component of the tourism industry and is a set of activities aimed at customer service. In modern business conditions in the market of hotel and tourist services for preservation of competitiveness of the hotel

enterprise it is necessary to implement the whole complex of innovative actions for formation and fixing of competitive advantages.

Therefore, the implementation of innovative activities should take place both at the state level and at the level of hotel enterprises. Further innovative growth will raise Ukraine's competitiveness in the global hotel real estate market. However, this is possible in the case of normalization of the economic and political situation in the country and the creation of conditions for investment attractiveness of the hotel segment.

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THE ROLE OF LOW INTEREST RATES AND OF THE LIQUIDITY TRAP IN MONETARY POLICY

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Annotation. *How have we managed to end up with low, often 0%, or even negative central bank interest rates, and with the now undeniably existing liquidity trap, which was denied for so long by mainstream economists - and some actually still continue to deny it? In our study, analyzing the interest rate mechanism of the modern banking system, and examining the banking system's and the central bank's response to the crisis (mainly quantitative easing), we will look for an answer to the question how a significant increase in money during the past decade and a consequent low interest rate cause a liquidity trap.*

At the same time, the macroeconomic constellation that emerged after the 2008 global economic crisis shows that negative interest rates can, in practice, develop in the economy over a longer period of time as well. Economic agents react asymmetrically in relation to negative interest rate levels: while the corporate sector is more inclined to accept this, in the case of the population it provokes a psychological reaction and encounters more serious resistance.

Keywords: *low interest rate, negative interest rate, monetary policy, Hungarian National Bank (Magyar Nemzeti Bank), central bank easing.*

Introduction. The world has just managed, with great difficulty, to get over the slump caused by the 2007 global economic crisis, and the next economic crisis caused by the measures introduced to curb the COVID-19 epidemic is already here. After 2007, due to the rapid development of China, the global growth of the world economy continued for some time, but today it has come to a halt. Crises are by no means unique phenomena. “The current global financial crisis, which seems never ending for much of the world, began in 2007 and was not the first. Researchers at the International Monetary Fund (IMF) identified 124 systemic banking crises, 208 monetary crises and 63 episodes of sovereign debt default between 1970 and 2007. And there have been 48 serious crises in the last 300 years. The causes are systematic and the systematic causes would require systematic solutions” (Kennedy et al 2012).

Characteristics of the Liquidity Trap. The Economic analyses have long debated the possibility that a negative nominal interest rate would turn out to be long-lasting, while, at the same time, they acknowledged the existence of a negative real interest rate. The concept of the liquidity trap is attributed by many to Keynes, but as Koppány

writes in his article (2007, p. 975): “Although the name itself was first used by Robertson [1936] (albeit with content that was somewhat different from what it is today), the concept of the liquidity trap - along with so many things in the field of macroeconomics - is traditionally derived from the economic theory of John Maynard Keynes. According to Keynes [1965], due to uncertainty about the future and the speculative motive of liquidity preference, there is a positive lower threshold concerning long-term interest rate, at which the willingness of economic agents to keep money becomes infinite”.

The concept of the risk avoidance trap has emerged in the monetary economics literature, and its relation to the liquidity trap is well illustrated by the following quote: “Despite interest rates nearing zero and other monetary easing steps recently taken by large central banks, the economic environment has been characterized by low inflation and the existence of some threat of deflation in certain areas, while real economic activity remained subdued. Although the symptoms of the phenomenon are similar to that of the liquidity trap situation, important differences can be identified, suggesting that other factors may also play a role. One new type of approach that emerges in the literature identifies structural oversupply of low-risk assets as an underlying factor, exacerbated by cyclical effects during the crisis. The mechanism of the so-called risk avoidance trap is similar to the liquidity trap, however, it occurs only among low-risk assets, and so it follows that it can be regarded as a special type of the liquidity trap” (Horváth-Szini, 2015).

Mainstream economics continues to adhere to its usual conceptual framework, which focuses on the real economy (the principle of the neutrality of money), and its theories, with few exceptions, attempt to describe processes in real terms. The crises of recent decades, on the other hand, have shown that financial crises play a serious (and) independent - and therefore not subordinate - role in the crisis process, so it is necessary to include the processes taking place in the financial world into frameworks of interpretation. For the economy, including the central banks and the banking system, the real interest rate is of importance (Virág, 2015), but at the same time, the nominal interest rate also has an independent and important role. As Varga (2019, p. 131) explains in his study, “the particular caution exercised by banks in general and the central bank in particular regarding the negative nominal interest rate is essentially explained by a common argument. The usual explanation is that a substantial, negative interest rate simply cannot be effective because zero-interest cash would crowd out such financial products, which would ultimately lead to the end of the commercial banking’s account system and monetary system. Based on this logic, as soon as it became financially beneficial to amass mere cash, people would start taking their money out of banks and would keep it at home instead.

Based on a similar logic, a negative (benchmark) nominal interest rate can hardly be permanently integrated into the monetary system, as with a negative nominal interest rate the demand for credit from real economy participants would be unlimited and the supply of credit from commercial banks would fall to zero. It is due to negative nominal interest rate levels that financial crises may have a negative impact on welfare, and

they may, furthermore, also drastically impact macro-models, so it is not by coincidence that even the MNB's inflation model contains details related to this. Taking nominal processes into account reflects the international financial climate as a risk premium.

Some say that there is no real recovery from this situation because the crisis exists at a systemic level. According to Lietaer, the crisis was brought about by a homogeneous credit money system and the interest rate attached to it, and a possible solution would be to introduce several types of local money in economies (Kennedy et al. 2012). The helplessness of the system is at such a high level that the prolongation of the crisis seems to cast dark shadows over the world. The solution to this crisis would have to be a political solution based on realistic grounds, with a complete reform of the monetary system, and the regulation of the banking system and the curbing of its supremacy. Based on historical experience, there is little hope for this so far.

The Role of the Banking System in the Dilution of the Money Supply. Bank deregulations have made banks innovative and derivatives have emerged, and their deregulation along with other practices (such as the role of the negative functioning of credit rating agencies) have eventually led to the subprime crisis. Until 1971, the amount of speculative money was negligible compared to the total amount of money in the world. Profit can only be generated by the real sector and since the amount of speculative money also demands a return, this did not cause a problem for the world economy at that point. According to some financial economists (such as Lietaer 2015), the amount of money that was circulated in the world in 2000 was already 50 times more than it is needed to conduct international trading in goods, and that amount has been growing ever since. One of the main reasons why a systemic crisis is brought about is that the real economy is no longer able to generate as much profit as would be required by the huge amount of money treated as “capital”.

Prior to the end of the gold currency system in 1971, economies operated almost exclusively at fixed interest rates and exchange rates. As a result, during a crisis, much of the speculative money was destroyed because debts, and with them interest payments, disappeared. However, since 1971, in times of crisis, the banking system can raise its interest rates to very high levels due to a flexible interest rate mechanism, so that not only does the speculative surplus money NOT disappear, but it even gets multiplied. Interest-bearing interest causes a limitless increase in the amount of money, because the payment of interest requires a continuous expansion of said amount and the expansion of crediting itself. This is further enhanced by the dollar issuance of FED, which forces the world to operate the US economy on the basis of credit, which is to say that it is based on providing resources without anything in return. The central bank's response to the 2007 crisis, quantitative easing, has enormously increased the amount of money.

The result of a survey of four researchers (Armstrong et al., 2015) in the UK on the issue of negative interest rates is instructive. “In a circular question, experts on the subject, leading British economists, responded. The lesson, in short, is that yes, it would be possible for the interest rate to be as low as minus 2-3 percent - or even less - and no, it would not be worth thinking about, because a permanently negative interest rate would

do more harm than good. The solution would not be so complicated, on the one hand, because a negative base interest rate could easily be charged to the money already in the account, and, on the other hand, upon cash withdrawal - in theory, cash is a stock that pays zero percent interest - such a tax or tariff could be introduced that would ultimately function as a negative interest rate. In order to reduce the accumulation of cash, high-value denominations could be eliminated and, wherever possible, account money and payments with account money could be supported / allowed”.

The Impact of Negative Interest Rates on the Hungarian Retail, Corporate and Interbank Market. Economic agents are asymmetrically affected by negative interest rates. Table 1 shows the most important interest rates affecting the Hungarian banking system, from the crisis of 2007 to the present day. Between 23 September 2015 and 18 December 2018, the functions of the MNB's governing instrument were performed by a three-month deposit. Following the withdrawal of the three-month deposit stock, the role of the underlying reserve was taken over by the obligatory reserve, for which the MNB central bank base rate was 0.9% per annum for a long period, and then, following a 0.15% reduction twice over in the summer of 2020, the rate has become 0.6% per annum at the time of publication.

In order to limit the fluctuations of interbank interest rates, the MNB maintains an asymmetric interest rate corridor with a maturity of one day, the width of which will be 95 basis points, effective as of 27 March 2019.

The interest rate paid on an overnight deposit is the base rate minus 95 basis points, and the interest rate paid on a secured overnight loan is equal to the base rate. From 8 April 2020, the interest rate on overnight covered loans changed to 1.85%, while the interest rate on overnight central bank deposits remained at -0.05%, which is to say that the width and the middle remained at 0.90%. This means that the negative interest rate in this area has remained. A positive step taken by the central bank to improve the liquidity of the banking system is that the Hungarian National Bank (Magyar Nemzeti Bank) has not penalized the creation of reserves under reserve requirements (under-provisioning) since 24 March 2020 in view of the economic effects of the Covid-19 virus.

Table 1

The timeline of the Hungarian National Bank's (Magyar Nemzeti Bank) central bank base rate and interest rates related to monetary policy instruments between 2007 and 2020 (in percentages)

	Central bank base rate	O/N secured loan interest rate	O/N central bank deposit	Interest rate 3-month MNB deposit interest rate *	Interest paid on the amount of required reserves	Penalty interest rate in case of under - provisioning
2007.04.06	8,00	9,00	7,00	8,00	8,00	-
2007.06.26	7,75	8,75	6,75	7,75	7,75	-

2007.09.25	7,50	8,50	6,50	7,50	7,50	-
2008.01.01	7,50	8,50	6,50	7,50	7,50	7,50
2008.04.01	8,00	9,00	7,00	8,00	8,00	8,00
2008.04.29	8,25	9,25	7,25	8,25	8,25	8,25
2008.05.27	8,50	9,50	7,50	8,50	8,50	8,50
2008.10.22	11,50	12,00	11,00	11,50	11,50	11,50
2008.11.25	11,00	11,50	10,50	11,00	11,00	11,00
2008.12.09	10,50	11,00	10,00	10,50	10,50	10,50
2008.12.23	10,00	10,50	9,50	10,00	10,00	10,00
2009.01.20	9,50	10,00	9,00	9,50	9,50	9,50
2009.07.28	8,50	9,00	8,00	8,50	8,50	8,50
2009.08.25	8,00	8,50	7,50	8,00	8,00	8,00
2009.09.29	7,50	8,00	7,00	7,50	7,50	7,50
2009.10.20	7,00	7,50	6,50	7,00	7,00	7,00
2009.11.24	6,50	7,50	5,50	6,50	6,50	6,50
2009.12.22	6,25	7,25	5,25	6,25	6,25	6,25
2010.01.26	6,00	7,00	5,00	6,00	6,00	6,00
2010.02.23	5,75	6,75	4,75	5,75	5,75	5,75
2010.03.30	5,50	6,50	4,50	5,50	5,50	5,50
2010.04.27	5,25	6,25	4,25	5,25	5,25	5,25
2010.11.30	5,50	6,50	4,50	5,50	5,50	5,50
2010.12.21	5,75	6,75	4,75	5,75	5,75	5,75
2011.01.25	6,00	7,00	5,00	6,00	6,00	6,00
2011.11.30	6,50	7,50	5,50	6,50	6,50	6,50
2011.12.21	7,00	8,00	6,00	7,00	7,00	7,00
2012.08.29	6,75	7,75	5,75	6,75	6,75	6,75
2012.09.26	6,50	7,50	5,50	6,50	6,50	6,50
2012.10.31	6,25	7,25	5,25	6,25	6,25	6,25
2012.11.28	6,00	7,00	5,00	6,00	6,00	6,00
2012.12.19	5,75	6,75	4,75	5,75	5,75	5,75
2013.01.30	5,50	6,50	4,50	5,50	5,50	5,50
2013.02.27	5,25	6,25	4,25	5,25	5,25	5,25
2013.03.27	5,00	6,00	4,00	5,00	5,00	5,00
2013.04.24	4,75	5,75	3,75	4,75	4,75	4,75
2013.05.29	4,50	5,50	3,50	4,50	4,50	4,50
2013.06.26	4,25	5,25	3,25	4,25	4,25	4,25
2013.07.24	4,00	5,00	3,00	4,00	4,00	4,00
2013.08.28	3,80	4,80	2,80	3,80	3,80	3,80

2013.09.25	3,60	4,60	2,60	3,60	3,60	3,60
2013.10.30	3,40	4,40	2,40	3,40	3,40	3,40
2013.11.27	3,20	4,20	2,20	3,20	3,20	3,20
2013.12.18	3,00	4,00	2,00	3,00	3,00	3,00
2014.01.22	2,85	3,85	1,85	2,85	2,85	2,85
2014.02.19	2,70	3,70	1,70	2,70	2,70	2,70
2014.03.26	2,60	3,60	1,60	2,60	2,60	2,60
2014.04.30	2,50	3,50	1,50	2,50	2,50	2,50
2014.05.28	2,40	3,40	1,40	2,40	2,40	2,40
2014.06.25	2,30	3,30	1,30	2,30	2,30	2,30
2014.07.23	2,10	3,10	1,10	2,10	2,10	2,10
2015.03.25	1,95	2,95	0,95	1,95	1,95	1,95
2015.04.22	1,80	2,80	0,80	1,80	1,80	1,80
2015.05.27	1,65	2,65	0,65	1,65	1,65	1,65
2015.06.24	1,50	2,50	0,50	1,50	1,50	1,50
2015.07.22	1,35	2,35	0,35	1,35	1,35	1,35
2015.09.25	1,35	2,10	0,10	1,35	1,35	1,35
2016.03.23	1,20	1,45	-0,05	1,20	1,20	1,20
2016.04.27	1,05	1,30	-0,05	1,05	1,05	1,05
2016.05.25	0,90	1,15	-0,05	0,90	0,90	0,90
2016.10.26	0,90	1,05	-0,05	0,90	0,90	0,90
2016.11.23	0,90	0,90	-0,05	0,90	0,90	0,90
2017.09.20	0,90	0,90	-0,15	0,90	0,90	0,90
2018.12.19	0,90	0,90	-0,15	-	0,90	0,90
2019.03.27	0,90	0,90	-0,05	-	0,90	0,90
2020.04.08	0,90	1,85***	-0,05	-	0,90	0,90**
2020.06.24	0,75	1,85***	-0,05	-	0,75	0,75**
2020.07.22	0,60	1,85***	-0,05	-	0,60	0,60**

Source: Own edition. Database: MNB (2020) <https://www.mnb.hu/monetaris-politika/a-monetaris-politikai-eszkozok/egynapos-jegybanki-eszkozok>

Comments:

* Central bank bond with a validity of two weeks from 10 January 2007 to 31 July 2014; Central bank deposit with a validity two weeks before 10 January 2007 and from 1 August 2014 to 22 September 2015, central bank deposit with a validity of three months from 23 September 2015 to 18 December 2018.

** From 24 March 2020, the MNB will exempt domestic credit institutions subject to reserve requirements from the legal consequences of non-compliance with required reserves.

*** Equal to the interest rate on a 1-week secured loan.

Figure 1 illustrates the role of low and negative interest rates in the liquidity trap. The chart shows that from 2016, interest rates are in the negative range on two different levels. An important change in this process was that on 13 November 2016 the interest rate on overnight loans was set by the Hungarian National Bank (Magyar Nemzeti Bank) at the base rate, the overnight deposit rate was 95 basis points below this level, which is to say that the deposit rate became negative: the central bank base rate with a gap of 95 basis points: 0.9 to $0.95 = -0.05\%$. In order to limit the fluctuations of interbank interest rates, the Hungarian National Bank (Magyar Nemzeti Bank) introduced an asymmetric interest rate corridor with a one-day validity, the width of which is set at 95 basis points from 27 March 2019. The interest rate paid on the overnight deposit is the base rate minus 95 basis points, and the interest rate on the secured overnight loan was equal to the base rate. Figure 1 does not include the changes in central bank interest rates that took place from 8 April 2020, as described above in connection with Table 1. From 8 April 2020, the interest rate on overnight covered loans changed to 1.85% , while the interest rate on overnight central bank deposits remained at -0.05% .

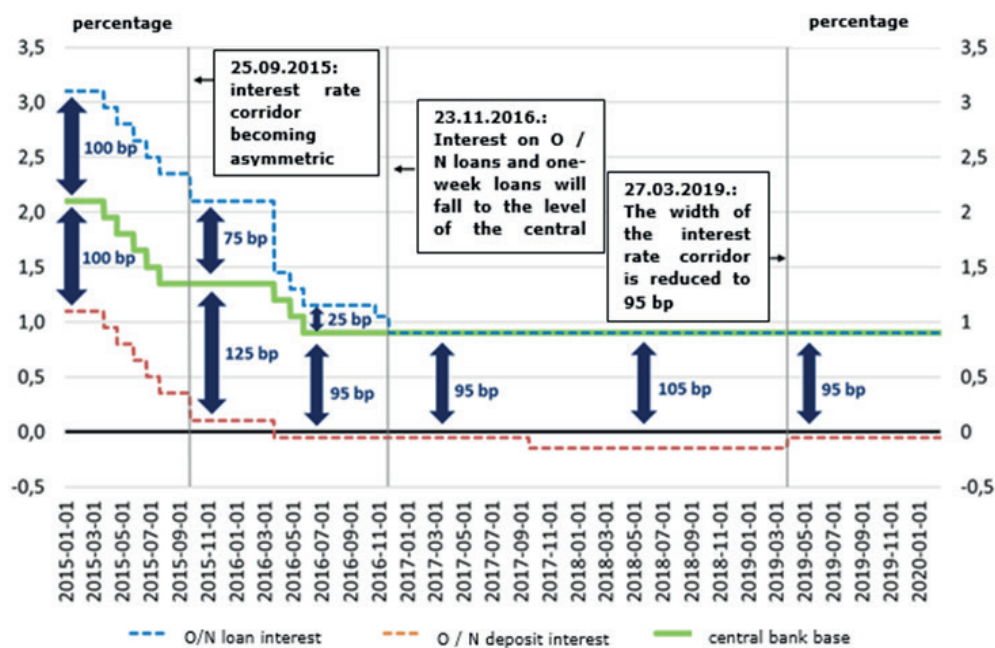


Fig. 1. MNB (2020a): The Monetary Policy Toolkit of the Hungarian National Bank (Magyar Nemzeti Bank)

Source: <https://www.mnb.hu/monetaris-politika/a-monetaris-politikai-eszkozatar/tanulmanyok-eloadasok-kezikonyvek-az-eszkozatarrol/eloadasok>

In the course of an economic assessment of the negative interest rate for the retail and corporate sectors, we may encounter asymmetric behavior. In the case of a substantial

negative deposit interest rate on retail deposits, for business policy reasons it is worth keeping the interest rate close to technical zero: a decline in cash would presumably deter many people from banking, which would mean a greater loss through commission and fee income than a potentially minimal loss to the bank in placing these deposits in the central bank or securities market.

When it comes to corporate deposits, the situation is different. Regarding the corporate sector, a low, zero or small negative interest rate has no psychological effect, since the majority of the revenues of the economic sector are generated by the sales revenue received in exchange for its activities, while the role of financial revenues is typically negligible. On the other hand, the cost of corporate cash logistics is high - higher than it is in the case of the general public - so it is easier to tolerate negative interest rates from this direction as well. From this it follows that due to the higher cost of holding cash, the business sector tends to pay a negative interest rate. In Hungary, as of 2015, referring to credit institutions and financial enterprises, statute CCXXXVII. section 280 of 2013 accepted the possibility of a negative interest rate in the case of non-natural persons: "In a deposit agreement concluded with a non-natural person - in contrast with the Civil Code. 6: 390th § (1) - based on the amount of the deposit, an interest of 0% or a negative interest rate may be stipulated. If a negative interest rate is applied, the amount to be repaid shall be reduced in proportion to the negative interest rate. "

Conclusions and suggestions. Is There a Way out of the Liquidity Trap?

According From a technical point of view, the solution to using a negative interest rate is not complicated. A negative base interest rate can be easily charged on money in bank accounts, and a cash tax or levy could be levied on cash withdrawals at the time of withdrawal, which would ultimately act as a negative interest rate. In essence, this is how transaction tax works. In order to reduce the accumulation of cash, some technical steps could be taken, such as the elimination of high-value denominations, or supporting payment transactions with account money within this system. In this area, the introduction of an immediate payment system is of great importance, in which transfers under a ten million forint item are completed within a few seconds.

A huge advantage of a system with a negative interest rate would be that, similarly to local monetary systems (cf. the work of Lietaer et al (2015), Lietaer-Belgin (2017), Kennedy et al (2012)), it could stimulate the economy, encouraging economic operators to spend money. It would, however, have the disadvantage of adding more complexity to and reducing the transparency of the financial sector. This would bring about the reduction of the effectiveness of financial intermediation mechanisms. According to a generally accepted economic opinion, based on the survey presented (Armstrong et al., 2015), only a quarter or third of the respondents would think it a good idea to use a negative interest rate, while the majority would rather stimulate the economy by raising inflation thresholds and introducing a more effective fiscal policy.

In our view, in the case of the liquidity trap - and, within that, the risk aversion trap - there is a systemic problem caused by anomalies in the financial system, such as a rigid central bank independence, a floating interest rate, the possibility of unlimited money

creation, and so on. For a way out, so as to find a solution to the crisis, the political and financial "great powers" would need to have the intention to change. The idea of 'welfare capitalism', that is, the Keynesian theory of effective demand, should be brought back, but not in its original form. The neoliberal mainstream either does not recognize this or, even if it does, it cannot support it because it would mean a complete abandonment of the principles they have hitherto proclaimed.

The first step towards a solution would be to give up the dogma of an independent central bank and transfer the right to issue money to state central banks. In addition, the privilege of private banks to allow moving interest rates should be strictly regulated. Finally, we should return to the 100% reserve ratio, which was also proposed by Friedman, which is to say that we would have to abolish the right of private banks to create money. As a result, money lending and money creation would be separated. This is a minimal program that would eliminate the current opportunities of private banks to create unlimited amounts of money and the compulsion of the world towards unlimited growth.

Such a transformation of the monetary system would have considerable losers. The financial sector is accustomed to being able to ultimately pass on its losses to consumers. However, this channel is visibly clogged, economic activity is not growing properly in a liquidity trap, and economic subjects are unwilling to (significantly) increase their consumption. Due to the merger of politics and money owners, there does not seem to be any short-term solution on the horizon. It is expected that tough political changes will lead to a solution, to the curbing of the dominance of the financial world.

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PROBLEMS OF SOCIAL PROTECTION OF MILITARY SERVANTS IN UKRAINE

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Annotation. *The state of scientific elaboration of the problem of social protection of participants of the anti-terrorist operation and members of their families is determined, the content of basic concepts and categories is revealed. The peculiarities of the implementation of mechanisms of social protection of anti-terrorist operation participants and members of their families in Ukraine are clarified. The main groups of problems of social protection of anti-terrorist operation participants and members of their families in the context of modern challenges with the application of research strategy are revealed.*

Keywords: *social protection of anti-terrorist operation participants and members of their families, mechanisms of social protection of anti-terrorist operation participants and members of their families, model of providing state regulation of social protection of anti-terrorist operation participants and members of their families.*

The problem formulation. An analysis of the causes and conditions that caused the crisis in welfare states reveals one of the main reasons: the collapse of certain social protection programs against the background of declaring democratic values and the importance of social transformations, historical experience shows the possible consequences of ill-considered steps. Among the preconditions for the crisis there is the excess of social protection expenditures over state revenues, despite the increase in taxes and mandatory payments, and the popularity of paternalistic sentiments in society.

Analysis of recent researches and publications. The presence of theoretical and applied problems in this area increases the need for cooperation of public authorities with business structures, civil society organizations, scientists, practitioners in various fields, as well as the involvement of ATO participants and their families in the formation and implementation of state social policy. Various aspects of social protection of anti-terrorist operation participants and members of their families were studied in these people's scientific works: P.V. Vorona, I.O. Drobot, I.L. Grabchuk, T.V. Ivanova, L.E. Kisil, O.L. Korolchuk, M.V. Kravchenko, V.S. Kuybida, O.Y. Lebedynska, V.A. Matsko, L.M. Melnychuk, A.A. Popok, O.G. Pukhkal, N.O. Ryngach, L.M. Sinyova, S.O. Teleshun and others.

The purpose of the article is to develop practical recommendations for improving the mechanisms of social protection management of ATO participants and their families.

Main material presenting. The synthesis of scientific views on the historical development of social protection in the world made it possible to explore the main stages and levels of social protection development. The current stage of state regulation of social protection of war veterans is characterized by the regulatory state's growing role in relations with certain categories of people, including war veteran's family members

who need social protection.

According to the Decree of the President of Ukraine from April 14, 2014 № 405/2014, the decision of the National Security and Defense Council of Ukraine from April 13, 2014 "On urgent measures to overcome the terrorist threat and preserve the territorial integrity of Ukraine" is enacted [1] and thousands of servicemen and volunteers have been defending the territorial integrity of our state on its eastern borders for more than five years.

During 2014-2016, thanks to the joint efforts of the Verkhovna Rada of Ukraine, the Government and the public, a legislative framework regulating the social protection of participants of the Revolution of Dignity and members of the Heroes' of the Heavenly Hundred families was created. The legal framework for social protection of participants of the anti-terrorist operation and members of the victims' families was also laid.

In contrast to the traditional association of benefits with exemption (reduction or prolongation) from mandatory payments, taxes, fees, the list of benefits for ATO participants and their families includes non-financial benefits and additional rights (such as priority of obtaining land).

In scientific sources, including foreign scholars, there is a large number of interpretations of the concept of social protection. In particular, the vision of social protection as public and private initiatives, including the protection of certain categories of people from social risks, deserves attention. Representation of social protection as an activity of the state and non-state sector is found in the works of domestic researchers: A.M. Yarkho [2] and V.M. Roshkanyuk [3].

The category «social protection» is also found in the variation «social security» and is interpreted as a form of social security, in particular as the system of payments made by the government to the elderly, due to illness and unemployment, and others. In the USA, for example, the term «welfare system» is used for determining the entire social protection system, and «social security» is treated as a component of social protection [4].

The study detected the difference in the concepts of «social protection» and «social security», revealed the essence of social protection and its features in relation to ATO participants and their families in the modern domestic system of social protection, which are considered in terms of target groups of beneficiaries of benefits, social guarantees and social security, which becomes relevant in a difficult socio-economic and demographic situation of the country. In particular, the target groups include: anti-terrorist operation participants who have the status of a participant in hostilities, including volunteers; members of their families; children, wives (husbands), parents of fallen soldiers; people with disabilities from among the participants of the anti-terrorist operation who received injuries, mutilation, contusion or other injuries; civilians - volunteers, employees of enterprises, institutions, organizations involved in ensuring the conduct of the anti-terrorist operation, public associations representing the interests of the participants of the anti-terrorist operation in the public sphere. It is proposed to take into account the needs and interests of the above target groups during the development of a social protection measures set (legal, economic, psychological, educational, medical and rehabilitation) [5].

According to the analysis of the literature, it is determined that the lack of definitions in the legal field of the concept of «benefits of ATO participants and their families» and a consensus on its interpretation among scientists, it is proposed to understand this concept as financial (in the form of financial assistance) and non-financial privileges, preferences, additional rights and opportunities provided by state authorities and local governments to ATO participants and members of their families for special services in protecting the independence, sovereignty and territorial integrity of Ukraine.

Within the framework of consideration of the organizational and institutional mechanism, it was proposed to make the division of state regulation subjects in terms of their powers in the field of state regulation of social protection of ATO participants and their families into judicial authorities, authorities of general and limited competence, authorities and institutions of special competence (relevant institutions in this area, in particular the office of the Commissioner of the President of Ukraine for Rehabilitation of Combatants, the Ministry of Veterans of Ukraine, which must ensure the formation and implementation of state policy in the field of social protection of war veterans).

The difference between social welfare which is financed by the national budget and social protection (It is financed except national, and from local budgets). In this way on thoughts A.Oginska about representation of social protection as set of measures which are realized by the state concerning people who have been exposed to social risks, which became the losing of income (other deprivations); In this case the purpose of social protection is neutralization of negative effects of realization social risks for prosperity of separate person [6].

Social protection is expediently considered in a broad (1) and narrow (2) sense: in the first - to the all social sphere in society or as measures related to the social rights of man and citizen, in the second - as a definite and limited general reality, aimed at providing individual social assistance during life negatives or taking into account their professional social status [5]. Social protection of servicemen in the normative-legal field is a function of the state (its activity) aimed at establishing social / legal guarantees, first of all, for servicemen and members of their families in order to ensure the realization of constitutional rights and freedoms. Secondly, to meet the needs (in the law [1] specified: material and spiritual). Third, maintaining social stability in the military environment.

The Sustainable Development Strategy "Ukraine - 2020" provides for a number of reforms, including the reform of the social protection system [7]. The problem of social protection of members in the anti-terrorist operation (hereinafter - ATO) and members of their families occupies an important place in this reform, and among the priorities of state social policy of Ukraine.

On the basis of generalization of scientific approaches, analysis of historical development the vision of features of social protection is formed, and for clarification of essence of social protection of participants of anti-terrorist operation and members of their families in national system of social protection, the logical-semantic approach (semantics - from the Greek. "denoting"), which allows among the set of definitions on the selected topic to identify basic, additional elements, the main focus of the concept.

Of course, the social protection of servicemen in peacetime has a number of differences from the social protection of anti-terrorist operation participants. Among the basic elements of the definition: the positive essence of the definition, the object of influence; additional elements include - the essence and subjects of influence, auxiliary features.

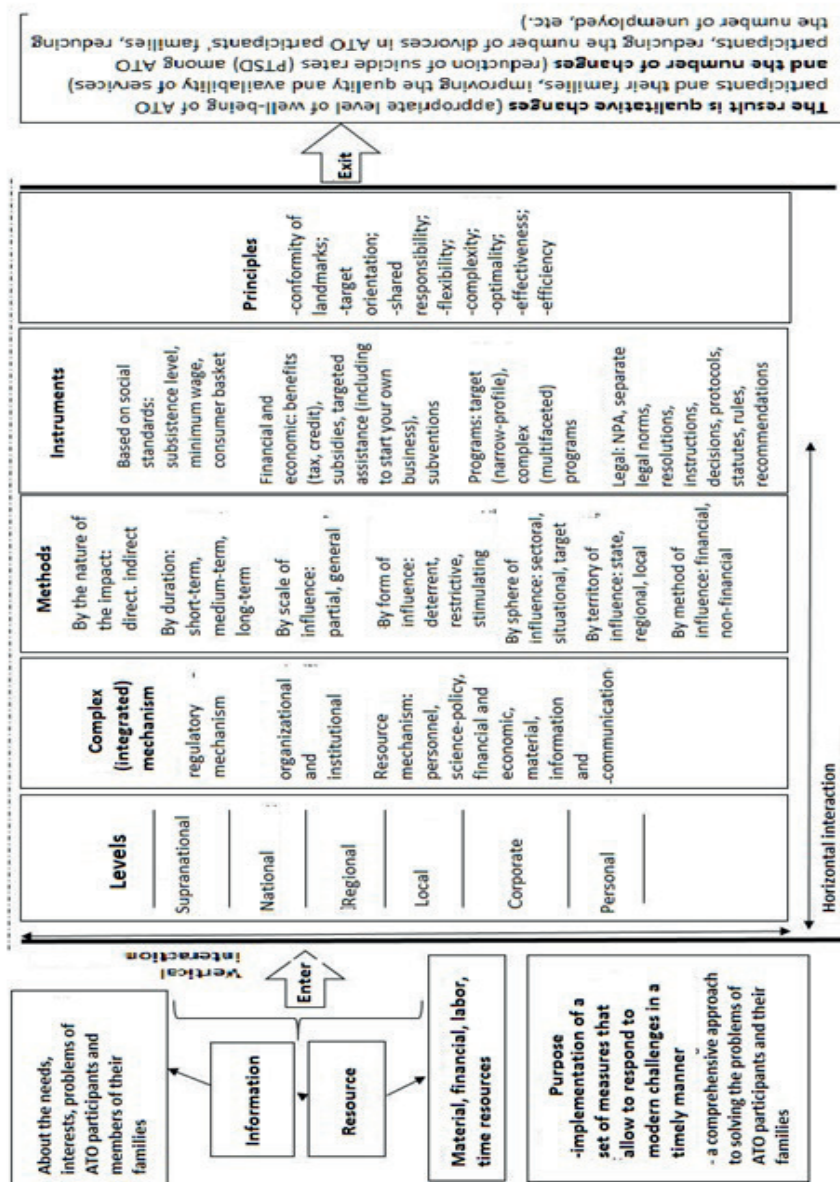


Fig. 1. Model of ensuring the modernization of state regulation of social protection of anti-terrorist operation participants and members of their families [9]

The model of modernization of state regulation of social protection of ATO participants and their families (Fig. 1) should be based on the principles of multilevel participation, the features of which are complex horizontal and vertical relationships and interactions between subjects of state regulation at the following levels: supranational (supranational institutions); national (President of Ukraine, Verkhovna Rada of Ukraine, Cabinet of Ministers of Ukraine, central executive bodies); regional (local state administrations, regional councils, district councils representing the common interests of territorial communities of villages, settlements, cities, military-civil administrations); local (local governments formed in territorial communities); corporate (enterprises, mass media, research institutions, public associations, including anti-terrorist operation participants); personal (anti-terrorist operation participants, members of their families).

The basis of normative and legal support of social protection of combatants are: the Constitution of Ukraine, relevant laws, Decrees of the President of Ukraine and Government decisions. More than one hundred normative legal acts regulate public relations in the field of social and legal protection of servicemen and members of their families. Nevertheless, the system of social protection for combatants today remains not properly regulated at the legislative level.

Issues of social protection of combatants are regulated by the Law of Ukraine "On the status of war veterans and guarantees of their social protection" № 45 of 22.10.1993 (hereinafter - the Law № 45) [7]. Law № 45 is aimed at protecting combatants by: establishing the legal status of combatants; providing appropriate conditions for maintaining health; providing benefits, advantages and social guarantees; formation of a respectful attitude to them in society. The law defines the basic rights, benefits and guarantees for participants in hostilities, but does not prescribe the relevant mechanisms and procedures for the exercise of these rights, which complicates their use. Today, the system of benefits, which includes more than 20 types, mostly has a compensatory rather than motivational focus, does not take into account the peculiarities of today and does not provide a decent standard of living for combatants.

The process of improving the legal framework for social protection of combatants is ongoing: revised and supplemented certain provisions of Law № 45, expanding the list of persons entitled to combatant status, participant in the ATO and the Revolution of Dignity, providing these persons with appropriate benefits [8].

For an effective state policy on social protection, the UBD regulatory framework lacks integrity, consistency, systematization and rapid response to today's challenges. Based on the generalization of the existing set of current regulations governing public relations in the field of social protection of combatants, developed and proposed their systematization according to the relevant classification criteria (Table 1).

Systematizing normative documents according to the proposed classification features, it should be noted that the same document may fall into different classes. The set of analyzed legislative acts and norms form the legal mechanism for the implementation of state policy on social protection of combatants. During this time, bills, bylaws, and state regulations were adopted programs that fragmentarily improve the social protection

system of UBD.

It is important for society that the defenders of the state in the face of a military threat have an increased level of protection of their social rights. Further development, compliance with modern challenges and the quality of regulatory and legal support play a powerful role in improving the system of social protection of combatants.

Table 1

Regulations on social protection of combatants

Classification feature	Types of regulations	Regulations
1	2	3
By legal force	Legitimate (determine state policy and regulate relations in the field of social protection of servicemen)	Laws "On Social and Legal Protection of Servicemen and Members of Their Families" № 2011-XII of December 20, 1991; "On the status of war veterans, guarantees of their social protection" № 45 of 22.10.1993; "On Ratification of the Agreement on Mutual Recognition of Privileges and Guarantees for Participants and Invalids of the Great Patriotic War, Participants in Combat Operations on the Territory of Other States, Families of Killed Soldiers" № 144/96-vr of April 26, 1996; "On improving the financial situation of combatants and war invalids" № 1603-IV from 16.03.2004 and others
	By-laws (play a supporting and detailed role, acts of central and local executive bodies, as well as relevant ministries and departments)	Resolution "On some issues of providing housing for servicemen and their families" № 476 of September 23, 2014; Resolution of the Verkhovna Rada of Ukraine "On Providing Proper Medical Care to Servicemen and Privates and Commanders Who Suffered Injuries, Contusions or Other Injuries during the Anti-Terrorist Operation in Eastern Ukraine" № 1286-VII of May 29, 2014; Decision of the Kyiv City Council "Procedure for providing assistance to Kyiv residents - members of the Anti-Terrorist Operation and families of Kyiv residents who died during the anti-terrorist operation operations" № 271/271 dated 09.10.2014 and others
By subjects of rule-making	Acts of the Verkhovna Rada of Ukraine	Resolution of the Verkhovna Rada of Ukraine "On Establishment of the Day of Ukrainian Peacekeepers" № 292-VII of 21.05.2013 and others
	International acts	Geneva Convention relative to the Treatment of Prisoners of War of 12 August 1949; Agreement "On mutual recognition of benefits and guarantees for participants and invalids of the Great Patriotic War, participants in hostilities on the territory of other states, families of fallen servicemen" dated 15.04.1994; Agreement between the Cabinet of Ministers of Ukraine and the Government of the Slovak Republic on military burials dated June 17, 2011 (ratification by the Law of Ukraine № 695-19 from 16.09.2015) and others

	Acts of the Cabinet of Ministers of Ukraine	Resolutions of the Cabinet of Ministers of Ukraine “On Approval of the Procedure for Granting and Depriving the Status of a Combatant of Persons Who Defended the Independence, Sovereignty and Territorial Integrity of Ukraine and Participated Directly in the Anti-Terrorist Op. № 413 of 20.08.2014, “On organizational measures for the application of the Law of Ukraine“ On the status of war veterans, guarantees of their social protection ”№ 63 of 08.02.1994,“ On the procedure for granting benefits provided by the Law of Ukraine “On the status of veterans war, guarantees of their social protection ”№ 94 of 16.02.1994,“ On the establishment of a monthly state targeted pension assistance to war invalids and participants in hostilities ” № 656 dated July 28, 2010; “On approval of the Procedure for psychological rehabilitation of participants in the anti-terrorist operation” № 1057 dated 27.12.2017 and others eration, Ensuring Its Conduct”
	Acts of the President of Ukraine	Presidential decrees: “On additional measures for social protection of participants in the anti-terrorist operation” № 150/2015 of March 18, 2015, “On the decision of the National Security and Defense Council of Ukraine of May 16, 2008” On granting the status of combatants to citizens of Ukraine participated in international peacekeeping operations ”№ 550/2008 of June 17, 2008; “On the decision of the National Security and Defense Council of Ukraine of February 18, 2015,“ On measures to create an appropriate material and technical base for the treatment, rehabilitation and rehabilitation of servicemen and other persons directly involved in the anti-terrorist operation, ensuring its conducting, as well as participants in hostilities and war invalids ”№ 140/2015 of 12.03.2015 and others
	Acts of ministries and other central bodies executive	Orders of the Ministry of Social Protection "On approval of the Standard Regulations on commissions for consideration of issues related to the establishment of the status of a participant in the war in accordance with the Law of Ukraine" On status of war veterans, guarantees of their social protection ”
		Ministry of Defense “On Approval of the Regulations on the Commissions for Consideration of Materials on Determining Participants in Combat Operations in the Armed Forces of Ukraine and the Instruction on the Procedure for Issuing Certificates of Participants in Combat Operations, Badges

By volume and type of distribution	General (Acts of general action, which apply to all servicemen)	Laws "On the Armed Forces of Ukraine" № 1934-XII of December 6, 1991; "On social and legal protection of servicemen and members of their families" of December 20, 1991 № 2011-XII and others "War veteran - a participant in hostilities" and others
	Special (Acts of special action that extend the validity of a certain category of persons)	"On the status of war veterans, guarantees of their social protection" № 45 of 22.10.1993, "On improving the financial situation of combatants and war invalids" № 1603-IV of March 16, 2004 and others
	Individual or exceptional (decisions on awarding the status of UBD awards, prizes, nomination to the next rank, decisions on demobilization, as well as decisions of judicial bodies on specific personal issues)	"On the Establishment of a Monthly State Targeted Pension Assistance for War Invalids and Combatants" № 656 of July 28, 2010; About the order of issue of the certificate and delivery of a breastplate "Veteran of military service" № 1601 from 30.08.1999 and others

Conclusions. Assessing the regulatory and legal support of social protection of combatants, it can be noted that today the state has formed a certain organizational and institutional and regulatory system of social protection.

One of the achievements in the field of social protection is the normative consolidation of general procedures for organizing social protection of combatants and their families regarding: rights and freedoms, benefits and social guarantees, simplification of procedures for obtaining combatant status, improving financial and medical support. Despite the achievements, many legally unresolved issues remain relevant, namely: protection of the rights of families of victims of UBD, some issues related to granting the status of UBD, reforming the benefits system, creating an insurance mechanism, introduction of social services standards and procedures, adaptation and rehabilitation. The Verkhovna Rada of Ukraine is considering a number of bills aimed at resolving them, but the speed of their consideration is extremely unsatisfactory. Today, the state must adopt appropriate laws that prescribe mechanisms for the implementation of rights, state programs and procedures for allocating funds for their implementation.

In order to improve the work of various users of information on the regulatory and legal support of the system of social protection of combatants, developed and proposed a systematization of regulations on the relevant classification features: legal force (laws and regulations); by subjects of rule-making (normative legal acts: the Verkhovna Rada of Ukraine, international, the Cabinet of Ministers of Ukraine, the President of Ukraine, ministries and other central executive bodies); by scope and type of distribution (general, special and individual or exceptional).

Further scientific development and implementation of proper legal regulation require issues of financial, medical, social and information support for combatants. In addition

to the above issues, to improve the regulatory and legal support of the system of social protection of combatants, it is advisable to study international experience in this area.

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PUBLIC ADMINISTRATION

INNOVATIVE FACTORS OF DEVELOPMENT OF RURAL TERRITORIES OF UKRAINE IN THE CONDITIONS OF A PANDEMIC

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Annotation. *The importance of rural development for the economy and society is actualized. The expansion of the powers of local communities requires the coordination of the community and the individual villager interests; and improving the quality and safety of life. Without overcoming the negative tendencies in the functioning of rural areas our state would not be able to compete effectively with the economic systems of developed countries. Such trends are observed in various spheres and first of all in the demographic sphere. Improving the situation in rural areas can be achieved through the return of migrant workers from abroad, and the migration of urban residents to the countryside.*

Keywords: *rural areas, innovation, development, pandemic, factors of development.*

Statement of the problem in its general form. Since independence, Ukrainian society has resisted economic, social challenges, and military aggression. For more than a year now, not only Ukrainian society, but also the entire world community has been in a state of crisis caused by the spread of the COVID-19 virus. There were borders not only between states, but also between regions and cities of one state. The personal, political, economic, social and cultural rights of citizens have been restricted in order to preserve their health and life. However, this crisis can contribute to the development of rural areas in Ukraine and accelerate the introduction of innovations that can reduce the negative impact of quarantine.

Problems of rural development have long been studied by Ukrainian experts. Their works reflect the thorough results of research on the principles of multifunctional development of the village, rural areas and rural space. However, despite the importance of research, the directions of rural development in the crisis have not yet been fully explored, especially in terms of innovative factors.

The purpose of this article is to study the factors overcoming the crisis of rural development.

Presentation of the main research material. Rural areas play an important role in the functioning of any state. On average, rural areas in the world make up 75% of the total area, where 51% of the world's population lives. In Ukraine, more than 30% of the population lives in rural areas. It is extremely important that these areas are convenient for healthy and productive living.

Rural development contributes to strengthening the economy and society. This is a prerequisite for Ukraine to achieve its goals of becoming the world's leading food supplier. Strong rural communities ensure that farmers maintain a competitive position with less negative effects on the environment, landscape and society. They support small and medium-sized businesses in their communities.

The effective start of rural development processes began in 2015. This is the adoption of the Law of Ukraine «On Voluntary Association of Territorial Communities». As of October 1, 2020, 907 united territorial communities (UTC) were created in Ukraine, of which 409 were rural and 205 were settlement. In Ukraine, 67.7% are rural and settlement communities.

In the process of administrative-territorial reform, the UTC included 9,240 villages. The expansion of the powers of local communities requires: harmonization of the development of agricultural production and rural territorial communities, the interests and initiatives of each villager, improving the quality and safety of life.

The villages are very different from each other. Today, significant sources of income of the united territorial communities are the funds of private investors, the funds of the residents of the community, including those received abroad as income of workers.

First of all, such funds are used by households for their own needs, such as children's education, repair work, purchase of real estate, improvement of their own land. It is important in the process of community development to realize the feasibility of directing these resources to long-term projects. The implementation of such projects has a multiplier effect for the whole community. For example, the creation of enterprises, farms, agricultural cooperatives, infrastructure development and improvement of common areas.

Local governments also use credits to finance the development of their community. Credit sources of financing for rural development have many potential advantages such as the ability to obtain significant financial resources, accelerating the development of local infrastructure. But there are also risks such as project failure, increased debt burden on the local budget and reduced financing of current expenditures, additional costs of project insurance and its examination. A separate source of funding for local socio-economic development is grant funds. Today in Ukraine, grant sources are often crucial for financing various local development projects. Grant assistance can be in the form of funds, consulting services, equipment, materials.

During 2016–2020, Ukraine received a lot of funds in the form of international technical assistance, which is designed to support decentralization and UTC: the EU ULIED project - a total of 97 million euros; American project DOBRE - total amount - 50 million US dollars; Projects of the Council of Europe, the Kingdom of Sweden,

the Kingdom of Denmark, the Kingdom of the Netherlands, the Swiss Confederation, Finland, Canada - more than 20 million euros.

European experience of rural development shows that an effective decentralized system of territorial organization of public administration is a component of a modern democratic state. The institutional basis of such a system is capable local self-government and balanced regional development.

In Ukraine, the European Charter of Local Self-Government is a guideline for local government reform. The changes that are being implemented today provide for the implementation of the principles of subsidiarity, the ubiquity of local self-government, financial self-sufficiency, and the widespread use of democratic mechanisms.

Ukraine faces the task of bringing local self-government and territorial organization of power in line with European standards and fulfilling the state's international obligations in this area.

Some European countries, such as Poland, realized the concept of decentralization and implemented it more than 100 years ago. They had positive and negative experiences of such changes. Negative experience is confirmed in the journalistic works of Ivan Franko. «Changing the system by itself does not have to lead to good, but, on the contrary, can lead to great disaster. We have a good example in old Poland. The main basis of the state system was noble freedom and equality. Every nobleman was the eldest lord and did not recognize any authority over himself. The decision of state laws, taxes and the army depended on the good will of the representatives of the region, and each decision could be stopped by the vote of one representative. This system led to the complete enslavement of peasants and the decline of cities» [11].

Based on our own traditions and international experience, we need to go the way of modernizing all spheres of public relations, including the decentralization of public power. Ukraine cooperates with the countries of the Council of Europe. Particular attention is paid to the study of the experience of legislative support of local government reform and territorial organization of power of those countries that are close to the Ukrainian realities in terms of political, economic, legal, geographical, demographic, social, cultural and other conditions. In addition, the practice of European countries with traditional decentralized systems deserves special attention.

Therefore, the world uses many different approaches to rural development. In urbanized countries, rural development programs focus on innovation and sustainable development.

Recently, the concept of «rural areas» is widely used in the scientific literature. But in determining their essence, content, there is a discrepancy between the practice of applying this concept and the degree of its scientific and applied study.

The draft Law of Ukraine «On Planning of Territorial Infrastructure of Rural Areas» stipulates that a rural territory is an area in which the share of the rural population in its total population exceeds 15-50 percent. Rural territory is divided into: clearly defined rural areas, where the share of rural population in its total population exceeds 50 percent; rural areas, where the share of the rural population is 15-50 percent of the total population [6].

S.Melnyk [1] defines the rural area as a historically formed element of the settlement network that combines the organizational and functional set of settlements, villages, hamlets, single-family and other residential entities under the jurisdiction of village (settlement) councils.

According to V.Slavov and O.Kovalenko, «rural area is an economic-ecological category, a regional-territorial formation with specific natural-climatic, socio-economic conditions, where economically and ecologically balanced and energetically interconnected different resources (natural, labor, material, energy, information, financial, etc.) in order to create a total social product of a particular area and a full-fledged living environment for present and future generations» [8].

O.Bulavka, clarifying the essence of the category «rural areas», notes that the organizational structure of rural areas embodies a two-block construction: the settlement network - as the basis of their development and the actual land area with forest, water resources and minerals [4].

V.Yurchyshyn, notes that the rural area, firstly, the socio-natural spatial formation, and secondly, the settlement network, an element of which is the rural area [10].

O.Pavlov in his works proves that the social component of rural areas is personified by the rural community, its defining social center. On the one hand, due to the fact that only he has the ability to breathe life into a particular rural area. On the other hand, the defining place of society in rural areas is due to the fact that its functioning should be gradually subordinated to the interests of creating in each rural area the best possible living conditions for its inhabitants [3].

We agree with their view that the concept of «rural areas» has a significant number of features. Their internal structure is complex. Especially stand out: production and economic, political, social, natural components.

Thus, rural areas are the spatial basis of production and the natural environment and place of human life where it is necessary to achieve better living conditions for its inhabitants.

Until 2019, there were negative trends in the functioning of rural areas. Without overcoming these trends in rural development, our state was not able to compete effectively with the economic systems of developed countries. In these countries, the living standards of rural and urban populations tend to converge as much as possible. Differentiation of living standards of rural and urban population in Ukraine threatened the outflow of the most active and able-bodied part of the rural population to cities, intensified external labor migration.

Today, many people have a desire to leave large urban areas and return to the villages, where you can enjoy the peaceful surroundings and fresh air. The spread of COVID-19 only reinforces this trend, as people in large cities live too close to each other.

There is also a forced return of migrant peasants from abroad. According to various estimates, the number of migrant workers is 1-2 million Ukrainians, ie 15% of the total rural population. All of them, having gained experience in the standards of quality of European life, have more progressive views and their own motivated needs, as well as

have the necessary level of knowledge and skills to create new business projects in rural areas.

Rural areas have significant natural, demographic, economic and cultural potential. In the case of its rational use, they are able to make a significant contribution to solving key problems of socio-economic development of the community. However, a significant part of rural settlements today is in a depressed state, after the processes: depopulation of the population, large-scale labor migration, closure of social facilities.

As a result, the processes of derivation are intensified. The form of derivation was the strengthening of inequality in access to social benefits of the rural population, the lack of opportunities to meet basic needs, self-restraint, lowering the level of consumption standards.

A significant problem of rural areas is the raw material orientation of the economy. The vast majority of the rural population does not participate in the distribution of income from the use of raw materials. This creates a conflict between business and rural communities and deprives communities of a major source of development.

The consequence of such a model of economy was the collapse of rural industry, social infrastructure, job losses.

The paradox of the situation in rural areas today is that some state measures were aimed at stimulating agricultural production and supporting competition in the agricultural sector. These are positive measures. But they occur against the background of «optimization». The essence of which is to curtail the activities of the socio-cultural sphere. This contradicts the innovative model of development as a strategic course to achieve economic growth in Ukraine.

Adverse trends in the deterioration of quality of life in rural areas are observed in various areas. In the demographic population there was an outstripping decrease in population, which led to an increase in the demographic burden in rural areas. The problem of unemployment has worsened in the labor market.

Today, the need to make serious adjustments to the methodology of developing rural development strategies is obvious. It is necessary to specify the goals, principles, tasks and tools of integrated rural development with reference to European principles and standards.

In order to determine the directions of rural development, it is necessary to pay attention to the approval of the Community Development Strategy.

A community development strategy is a long-term plan of consistent balanced actions aimed at maximizing the resources available to the community to achieve success, sustainable development and full realization of the goal.

The main tasks of strategic planning are: analysis of the socio-economic condition of the community; formulation of a promising realistic future vision; SWOT-analysis of strengths and weaknesses and external opportunities and threats; definition of strategic goals, the achievement of which will allow to realize the vision; development of operational goals and objectives to achieve strategic goals [12].

A strategy is a general plan to achieve one or more long-term or common goals in

conditions of uncertainty. In the sense of "general art", the term came into use in the 6th century AD. It was translated into Western languages only in the 18th century. From then until the 20th century, the word "strategy" came to mean "a comprehensive way to try to achieve political goals, including the threat or actual use of force, in the dialectic of covenants" in a military conflict in which both opponents interact [12].

Ukraine has developed a Concept for Rural Development until 2030. Its main directions:

- ensuring the development of socially necessary, competitive, and environmentally safe for the population the agricultural economy;
- improving the quality of life of the rural population, especially children, the disabled and the elderly;
- maintaining ecological balance, taking into account the balanced use and increase of natural resources of rural areas.

Overcoming the problems in this area requires direct state intervention. This can be done through the creation of a clear policy and legal framework, funding for specific targeted programs of rural social development.

The basis for such changes should be infrastructure innovations, taking into account today's challenges.

For example, the introduction of quarantine measures has accelerated existing trends in telecommuting, as well as its extension to new areas. Companies and employees have already invested in the necessary equipment, infrastructure, software settings, and acquired new skills. After the quarantine is lifted, some companies will deliberately leave some employees remotely.

Already, such elements of infrastructure as high-speed Internet, Internet banking, cloud technologies, innovative postal services have made it possible to effectively organize a large number of jobs at home.

First of all, we should focus on the elements of infrastructure that form a comfortable living (working) conditions. Today there is a large number of innovations that can quickly, efficiently and at a reasonable price to solve any organizational and household issues.

The strategic goal in the innovative provision of rural areas is the formation of favorable conditions for the use of the latest advances in science and technology in all spheres of management and life in rural areas.

These can be:

- development of projects of innovative development of rural areas on the principles of sustainable development;
- creation by the state of conditions for formation of effective system of production of innovations;
- deepening cooperation between the community and business;
- promoting international cooperation in the transfer of experience in rural development;
- formation of an effective infrastructure of innovation activity;

- application of new energy-saving technologies and energy-generating systems, small energy facilities, renewable energy sources, focused on the specifics of rural activities;

- intensification of interaction with foreign funds, partners.

Conclusions. The government's priority in the field of rural development is to create the necessary preferences for people who are forced to adapt to quarantine restrictions, which would stimulate them to work and develop business in Ukraine. This will make it possible to launch the following mechanisms for rural development, which will not only reduce the negative impact of quarantine, but also have a long-term effect on rural development:

- modernization and diversification of the rural economy;

- application of special management regimes for state support of households, which act as a preventive tool for deepening integration processes in the economy of rural areas;

- partnership of the state and UTC bodies in the implementation of state programs of structural restructuring of the rural economy;

- development of the state standard of living conditions of the rural population in terms of employment, education, health care, housing and communal services, development of industrial and social infrastructure;

- development of local self-government and strengthening of its financial base.

Thus, important factors in the development of rural areas of Ukraine in a pandemic are the return of peasant workers from abroad, as well as the migration of urban residents who moved to rural areas during quarantine. It is important to identify and consider these factors in a timely manner for the common good.

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INTRODUCTION OF THE MODEL OF PUBLIC DEPARTMENT OF EDUCATION AT THE LEVEL OF THE UNITED TERRITORIAL COMMUNITY

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Annotation. *The article summarizes the problems of state and public education management, the peculiarities of decentralization and the creation of capable united territorial communities. The urgency of the problem lies in the combination in the management of the education sector of national regulations and individual social initiatives. This combination creates public administration, which emphasizes the priority of the state with the obligatory consideration of public opinion.*

Keywords: *united territorial community (UTC), public civil administration, educational sphere, public education management.*

Ukraine has been undergoing a full-scale reform of local self-government for seven years, by giving it the powers, resources and opportunities to address local issues independently. The reform is accompanied by the formation of a capable united territorial community (UTC).

According to Article 32 of the Law of Ukraine "On Local Self-Government in Ukraine" in the field of education, the executive bodies of village, settlement, city councils are endowed with the following powers:

- management of educational institutions owned by territorial communities or transferred to them, organization of their logistical and financial support;
- ensuring the acquisition of full general secondary education, creating the necessary conditions for the upbringing of children, youth, development of their abilities, labor training, vocational guidance, productive work of students, promoting the activities of preschool and out-of-school educational institutions;
- ensuring, within the given powers, the availability and free education in the relevant territory;
- ensuring, in accordance with the law, the development of all types of education, development and improvement of the network of educational institutions of all forms of ownership [1]

According to Article 66 of the Law of Ukraine "On Education" the UTC Council:

- are responsible for the implementation of state policy in the field of education and

ensuring the quality of education in the relevant territory, ensuring the availability of preschool, primary and basic secondary education, extracurricular education;

- plan and ensure the development of a network of preschool, primary and basic secondary education, out-of-school education;
- guarantee the availability of preschool and secondary education for all citizens living in the territory;
- provide and finance transportation of students and teachers to primary and basic secondary education institutions;
- create equal conditions for the development of educational institutions of all forms of ownership;
- exercise other powers in the field of education provided by law [2].

Thus, the legislation defines local governments a significant list of powers and functions for independent decision-making, under their own responsibility and with all available resources, the provision of quality and affordable basic secondary education in the relevant area, in accordance with approved state educational standards [4].

At the same time, today in the educational sector of Ukraine there are problems that need immediate solution. Among them are: the imperfection of the education authorities; duplication of functions between public administration bodies of different levels and local self-government bodies; low quality of education, especially in rural areas; low community activity in educational decision-making processes.

Therefore, a combination of national regulations and individual public initiatives in the management of the education sector is considered important. Civil society requires an increasing role of public organizations in the content of education, its quality, in various aspects of achieving these goals. This combination of public and public administration in education creates public administration, which emphasizes the priority of the state with due regard for public opinion.

The national legal framework for the management of the educational sphere does not provide a clear definition of the concept of "public civil administration".

The National Strategy for the Development of Education in Ukraine for the period up to 2021 of June 25, 2013 indicates the need to develop a model of public administration in the field of education, "in which the individual, society and the state become equal subjects and partners" [3].

The Law of Ukraine "On Education" of September 5, 2017 among the principles of state policy in the field of education and the principles of educational activities (Article 6) also mentions the principle of public civil administration. The text of the Law does not clearly define this concept, but from the subsequent articles of the normative legal act it becomes clear the content that the legislator puts in it [2].

Public administration is a management that combines the activities of subjects of state and public institutions, based on the voluntary establishment of the state and citizens of certain responsibilities in the management of education in the interests of the individual, society, government. It presupposes close interconnection, cooperation, constant dialogue and interaction of state (administrative) and public

subjects of management. The leading principles of public administration are science, professionalism, humanization, openness [6].

The content of public administration is the activity of its subjects in the integration of three areas:

- 1) democratization of public authorities and education management;
- 2) development of self-governing associations of participants in educational activities (professional associations of teachers, student and parent self-government bodies of all levels);
- 3) creation and organization of public education authorities, where all segments of the population are represented [3].

Public administration of education is a process of combining the diverse activities of state and public subjects involved in the functioning and development of the educational institution, in the interests of the subjects of the educational process, society, government. The subject of public administration of education is the coordination of actions of different nature and direction of action of forces on the development of the educational system [5].

The National Strategy for the Development of Education in Ukraine states that "the modern system of education management is established as a state-public one. It should take into account regional peculiarities, tendencies to increase the autonomy of educational institutions, competitiveness of educational services, orientation of education not on reproduction, but on development".

The new governance model must be open and democratic. It must organically combine the means of public administration with public influence. The openness of the system implies the spread of the influence of public opinion on management decisions. It changes the workload, functions, structure and style of central and regional education management: direct intervention in the activities of institutions and educational institutions should give way to flexibility, scientific and methodological, prognostic, expert, informational and other functions [3].

Based on the Strategy, the goal of state-public education management is the optimal combination of state and public principles in the interests of the individual, society and government, and the main task - the redistribution of control and management at the level of educational institution and community.

The main principles of the state-public model of education management are humanization, professionalism, scientificity, adaptability, purposefulness, openness, tolerance, etc.

The effectiveness of reforming the education management system largely depends on how rationally and effectively will be used not only domestic but also foreign experience in education management. The transition to a public-public model of education management requires studying the experience of these processes in countries where the involvement of the general public has shown positive results.

In most countries of the world, education is managed at three levels: central or upper, regional and local. Central prevails in such European countries as Greece, Ireland,

Iceland, Italy, Norway, Portugal, France, and others. In countries with a federal state system (Germany, USA, Canada, Switzerland, etc.), education is governed by the subjects of the federation, which, incidentally, is the central level, and the federal in some countries does not exist at all.

Interesting experience has been gained in the United States. In particular, the involvement of parents in the problem and the implementation of educational programs is up to 37%. In 80% of cases, parents form the staff of teachers, 88% of educational programs include parents as organizers of excursions, trips, charity events. Conferences are systematically held with the participation of teachers, parents, psychologists, physicians, social workers, representatives of public organizations, foundations, etc. [7].

Polish public bodies and organizations related to education and upbringing operate in and out of educational institutions, respectively. The cooperation of the community with the state bodies in the management of education is closely connected with self-government (local, pupil, student, postgraduate and the educational institution itself). Significant in resolving this issue are the conditions for the election of representatives to public bodies, the scope of their activities, competencies and responsibilities, subordination and cooperation between themselves and with local governments [8].

The results of the analysis of the theoretical foundations and current practice of public administration of education in our country and abroad confirmed the need for democratic transformations of the management system in Ukraine.

The organizational structure of state and public education management includes public authorities and local governments, education authorities at the city level, public administration and self-government at all levels. Therefore, public administration of education can be represented as the integration of three areas: democratization of public authorities and education management; development of associations of participants in educational activities (professional associations of teachers, student and parent self-government bodies of all levels); creation of organizations of public education management bodies.

Practically at the state level the normative base for introduction of model of the state-public management of education is formed. We have the following documents: Law of Ukraine "On Education"; Law of Ukraine "On General Secondary Education"; Law of Ukraine "On Extracurricular Education"; Law of Ukraine "On Preschool Education"; Law of Ukraine "On Local Self-Government".

Theoretically, there are the following models of public administration that can be implemented: structural and public support, which provides for each management level of the relevant public structure, the main task of which is an independent examination of the state of education, dialogue with authorities to balance interests of the public and governing bodies of general secondary education; information and public support, which provides for the organization of counter-flows of information: from top to bottom comes the regulatory information, and from the bottom up - the claim, the reaction of public performers to regulatory and social and value information; subordination-intermediate partnership, which provides for the introduction of dynamic vertical subordination

relations. The public is involved in the tasks and relations are temporarily transformed into partnerships.

The model of public administration of education at the level of UTC may look like:

State component: Verkhovna Rada; Cabinet of Ministers, Ministry of Education and Science of Ukraine; Regional State Administration; Department of Education and Science of the Regional State Administration; local governments.

Public component of self-government: regional council; Board of the Department of Education; Council of heads of UTC educational institutions; Council of leaders of student government.

A significant place in the model of state-public management of the UTC education system should be occupied by the structure of activities that provides a personality-oriented principle of education to support the development of educational institutions, improve teachers' skills, create conditions for self-realization of students, involve parents in the educational process. Ensuring interaction between all participants in the educational process, which is based on respect for the identity of each child, protection of children's rights and democratic freedoms, demanding and controlling the psychology of relationships in teams - is a requirement of time and modern educational paradigm. That is why it is necessary to emphasize the active involvement of parents and students and the community in cooperation with educational institutions.

In fact, public administration and self-government bodies should pursue the same goal - to meet the educational needs and interests of participants in the educational process. The only difference is that individual self-government bodies are designed to meet the specific needs of teachers (pedagogical self-government bodies), students (student self-government) and parents (parental self-government), and public administration bodies meet the general needs of all participants in the educational process.

Among the best practices of state and public education management is the practice of Slobozhanska UTC of Dnipropetrovsk region. Its territory is home to 14,423 people, including 2,706 children, including 1,529 school-age children. There are 3 schools and 3 preschools in the community. Until May 2016, community institutions were managed by the district education department. As a result, the educational subvention was returned to the district.

The community had limited influence on the management of education, but its responsibility to parents and teachers remained high. That is why the Slobozhanska community decided to create its own education management body. This provided an opportunity to implement their own plans and measures aimed at improving the quality of education, in particular, the following results were achieved: the program of education development for 2016-2020 was approved; the mechanism of providing methodical services is developed and implemented; initiated and granted financial autonomy to 3 schools and 4 preschool educational institutions; an out-of-school education center was organized, which provides services for 1,320 pupils in 11 areas; agreements on cooperation with Dnipropetrovsk higher education institutions were concluded, which helped to increase the activity and effectiveness of children's participation in competitions

and Olympiads [4].

Another example of effective practice is the experience of Verbkiivska UTC. It has 1,306 children, including 638 schoolchildren. The district center for out-of-school education (COE) operated in the village of Verbki. After creation of UTC the district council made the decision on transfer of regional COE from the village of Verbki to the city. As a result, the lack of out-of-school activities in the community has exacerbated the transfer of children to the city's educational institutions and the outflow of professionals. In addition, according to the head of the community education department, the analysis of the state of out-of-school education showed that the old system of providing out-of-school services is no longer effective. It did not take into account the needs of students and did not ensure equal access to extracurricular education for all children, as 45% of UTC children were not covered by out-of-school education. All these factors influenced the decision to establish its own COE. The following results have already been achieved: a survey of community residents was conducted to determine the areas of work of the COE; an out-of-school education center has been established to provide access to out-of-school education for all children in the community; the number of children covered by out-of-school education increased by 50%; pre-school training of 200 children was carried out on the basis of COE; during the period of the center's work 30 winners of competitions of both regional and all-Ukrainian significance were prepared; 13 jobs were created.

According to the head of the Center, today the center is developing successfully, a sign of this is the growing number of clubs. The community understood how important it is to ensure that the activities of out-of-school education institutions meet the needs of community residents and the availability of out-of-school services for all children [4].

Conclusions. Thus, in the management of education at the UTC level in the context of forming a capable educational network, cooperation between public authorities and residents of the territorial community should be ensured. A key element and a serious challenge for local governments is to create a management system that is adequate to the needs and capabilities of the community. In addition, an effective system of community education management should attract professionals who are able to form a modern vision of educational development and make effective decisions on the implementation of self-governing and delegated powers in education.

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PEDAGOGY AND PSYCHOLOGY

MODEL OF PSYCHOLOGICAL DEADAPAPTABILITY OF VETERANS OF ANTI-TERRORISM OPERATION

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Annotation. *The article considers the peculiarities of the mental state of ATO veterans after returning to peaceful living conditions. The paper presents the features and difficulties faced by ATO veterans in the process of adaptation to peaceful conditions. Characteristic changes as a result of the deformation of personal structures of ATO veterans as a result of long action of stress factors are described. The problem of psychological maladaptation of ATO veterans and its main characteristics are covered in the article. The model of psychological maladaptation of ATO veterans is offered, the model includes factors of maladaptation; attitude to war; maladaptive forms of behavior; motivation to participate in hostilities.*

Keywords: *adaptation, maladaptation, post-traumatic stress disorder, anti-terrorist operation, flashback, disharmony, personal-adaptive potential.*

Problem statement. To preserve its territorial integrity, sovereignty, and independence, Ukraine is forced to participate in the anti-terrorist operation (ATO). Given that the fighting in eastern Ukraine began in 2014 and continues up to this day, a significant number of young people took part in the anti-terrorist operation during this period. Given that Ukraine and its citizens were caught unawares by the hostilities, and the country was not ready for a military confrontation, accordingly, training for combat operations was carried out in an express mode. As a result of these preconditions, after demobilization, the manifestation of maladaptation became characteristic for the participants of the anti-terrorist operation. Most anti-terrorist operation participants return from battlefields with pronounced manifestations of post-traumatic stress disorder (PTSD), which prevents them from adapting to their usual lives. Disadaptation leads to deviant behaviors, addictions, and suicidal tendencies in ATO veterans. That is why the problem of finding ways, methods of prevention, and correction of manifestations of anti-terrorist operation veterans' maladaptation has become acute in the society, which is impossible without a clear understanding of the peculiarities of maladaptation and its structural components.

Analysis of recent research and publications shows that the problem of the impact of hostilities on the human psyche is the subject of intensive research. Thus, several works are devoted to the problem of the "Vietnamese syndrome" (M. Horowitz, N. Wilner, N. Kaltrader). The problem of maladaptation of the individual, in general, is covered in the works of L. Mardakhaev, T. Molodtsova. At the same time, the problem of psychological maladaptation of anti-terrorist operation veterans needs to be studied,

because in psychological science this problem was previously considered through the prism of maladaptation of the individual as a whole.

The purpose of the article is to analyze the features of the psychological maladaptation of anti-terrorist operation veterans and models of maladaptation.

Presenting main material. The study of the problem of psychological maladaptation of ATO veterans should be based on the analysis of the components of this phenomenon, because only through the understanding of each of the components one can understand the essence of this problem, its globality, and consequences for ATO veterans and the country as a whole. After all, the presence of a significant number of psychologically maladapted citizens in the country creates the phenomenon of "total maladaptation of the country", because the psychological maladaptation of ATO veterans affects not only them but also those around them.

Thus, in general, maladaptation is understood as a certain violation (deviation) of the process of adaptation of the organism to new living conditions. In the psychological literature, the problem of psychological maladaptation has been studied in the context of maladaptation of students. Therefore, previous work on the study of psychological maladaptation is not able to fully reveal the features of psychological maladaptation as a result and consequence of participation in hostilities. Because psychological maladaptation as a result and consequence of long-term exposure to traumatic factors has its specifics.

Thus, when returning to a peaceful life, anti-terrorist operation veterans faced the fact that their military experience is unnecessary or the possibility of its use is limited by the received wounds, etc. Ambiguous attitude of citizens to anti-terrorist operation veterans, long stay in extreme and stressful conditions leads to the fact that participants of anti-terrorist operation appear uncompetitive in the labor market. This kind of social "alienation", isolation leads to psychological problems, generates aggression and self-aggression.

A. I. Yena, V.V. Maslyuk, A.V. Sergienko as a result of the study found that about 80% of combatants, especially immediately after returning from the hospital, have a clear attitude and lack of desire to have an active life and social position, which is manifested in the desire to receive a disability group, benefits, etc. The basis of this is the activity to protect the group interests of veteran soldiers [5, p. 7]. In addition, a significant number of anti-terrorist operation participants after returning to peaceful conditions begin to show a keen desire to work outside the team. Lack of a clear vision in which direction to move, unwillingness to accept the difference between life "there" and "here", manifestations of PTSD, lack of understanding from their relatives gradually exacerbates the manifestations of psychological maladaptation in ATO veterans.

In addition, according to O.O. Bukovska, in the process of adaptation to peaceful conditions, there is a risk that ATO veterans will transfer their perception of the environment through the "military prism of reality" to their own families. And this provokes, on the one hand, unfounded fears for the family, and on the other - anxiety about changing the attitude of the family to themselves [1, p. 29]. All this is due to

the fact that after demobilization, the participants of the anti-terrorist operation can no longer return to their former jobs or get a job quickly, which destroys their image of a "breadwinner". Those who were injured, in addition to the above mentioned, tend to think that their wives will not accept them, that they are now a burden to the family, as a result - 90% of families after demobilization of ATO members who were injured or incapacitated are on the verge of divorce.

Thus, maladaptation as a manifestation in the general sense is an external characteristic of human disorders, which are manifested in atypical behavior, attitudes and performance in specific environmental conditions. Atypical forms of behavior and attitudes as a manifestation of maladaptation in anti-terrorist operation veterans is manifested in: isolation; limiting contacts only with "comrades-in-arms"; difficulties in establishing communications in peace; distrust of the world around us, especially with regard to state structures.

All these behavioral manifestations of psychological maladaptation of anti-terrorist operation veterans can occur suddenly if we are talking about an outside observer, but in reality these are not groundless and situational manifestations. As a rule, they arise as a result of external catalytic factors (screams, sudden applause, muffled steps) and the beginning of the development of a critical state goes unnoticed, and the external manifestations of the crisis arise as a result of internal experiences.

The so-called flashbacks, return to past experiences (battle, ambush, captivity) and the manifestation of inadequate reactions (sudden desire to crawl, hide under the table) deplete the psyche, exacerbate the negative psychological well-being of ATO veterans, especially if they arise under the influence of such thoughts as: "They will never understand me!" Similar destructive conditions are found in more than half of ATO veterans. And as a rule, the stress they experienced affects the fact that ATO veterans are not able to determine the difference in the degree of mismatch of mental reactions to stimuli before and after the traumatic events [3, p. 77].

Given all the above, it follows that psychological maladaptation as a result of traumatic events reflects the internal or external (sometimes complex) disharmony of the individual's interaction with himself and society, manifested in internal discomfort, behavioral disorders, relationships, and activities. This condition is evidence of exhaustion of both physical and mental strength of man, in fact, the loss of "former self" [6, p. 138]. As for recognizing changes in their psychological and physical condition, only a small number of anti-terrorist operation veterans indicate that they do not notice any changes, while most understand that "they are not the same as before." These trends are due primarily to the form of the contract (contractors, officers, soldiers, volunteers) and, accordingly, the motivation to participate in hostilities, which in turn affects the perception of their consequences.

In addition, psychological maladaptation as a result of traumatic events is largely related to the experience of ATO veterans of post-traumatic stress disorder, the manifestation of which indicates that defending their country, its integrity and independence, ATO members were exposed to extremely strong combat stress, that leads

to internal and external disharmony of personality interaction.

According to O.V. Topol, the result of psychological maladaptation of ATO veterans are various forms of addictive behavior, through which they try to change the state of consciousness, "escape" from reality into an illusory, virtual world resorting to alcohol, drugs, games, etc. [8, 231].

A.I. Yena and V.O. Mogilev point out that the long-term impact of combat stress leads to the deformation of the personal structures of the participants of the anti-terrorist operation, the emergence of such characterological changes as: emotional instability; anxiety and alertness, increased vulnerability; irritability up to the violent affective outbursts, unmotivated anger, dysphoria; heightened sense of justice, maximalism in judgments and actions; feelings of helplessness, fear, nervousness; tendency to manifestations of pronounced protest reactions [5, p. 6].

In this case, it is the reaction to the original event that causes more harm than the event itself, because a high level of anxiety "controls" the mind of the ATO participant, forcing him to believe in the realism of scary thoughts, which in ordinary situations are simply not perceived.

M.I. Mushkevych noted that ATO veterans are characterized by a complex disharmony of personality interaction, which gradually exacerbates their state of psychological maladaptation. Such manifestations included: attempts to avoid thoughts, feelings, and conversations related to trauma; attempts to avoid actions, places, or people that evoke memories of trauma; partial or complete amnesia of important aspects of the injury; a pronounced decrease in interest in previously important activities or participation in them; feelings of general alienation from loved ones; inability to focus on the long term; hyperactivity, which is manifested in irritability or outbursts of anger, excessive vigilance, exacerbated reaction to sharp signals [7, p. 138].

Thus, in a state of crisis, primitive protective mechanisms of personality are activated, in particular projection, displacement, denial, isolation.

Thus, the state of psychological maladaptation of ATO veterans is accompanied by a feeling of dissatisfaction that there is no clearly defined end and causes constant involuntary returns to episodes of life that have already happened and therefore do not allow them to adequately respond to events. Such manifestations of psychological maladaptation are obvious, as prolonged stay in combat conditions, injuries are serious stresses that cause disturbances in the perception of anti-terrorist operation veterans of the picture of life, other people and situations around them.

In addition, a significant problem for many ATO veterans is the inability to divide their lives into "before" and "after", where "after" means a new stage and moving forward. The veteran of anti-terrorist operation after returning to peaceful conditions for a long time is as if on border: physically - "here", in the peaceful territory, in the family or among friends, carrying out habitual actions, and mentally - remaining "there", again and again experiencing former emotions, events, remembering friends, thoughts, things or even household trifles [2, p. 176]. All this indicates a lack of control over the situation unfolding in the inner, subjective world of the individual. The existence of an "abyss"

between the physical and the mind leads to an attempt to replace the existing reality with the desired and as a consequence - the emergence of frustration.

According to G.G. Averyanov and A.V. Kurpatov, the very feeling of dissatisfaction is a key sign of psychological maladaptation of ATO veterans, which in turn is a form of rejection of reality and resistance to it. As a result, the process of psychological adaptation is impossible without the acceptance of anti-terrorist operation veterans of the conditions of their existence [6, p. 23].

The presented in Figure 1 model demonstrates the idea of the structure and features of psychological maladaptation of anti-terrorist operation veterans. Thus, in the structure of psychological maladaptation of anti-terrorist operation veterans, it is possible to allocate the factors causing the occurrence of the specified phenomenon. In particular, the internal factors of psychological maladaptation include the presence of internal conflicts caused by the mismatch of expectations of reality; anxiety; manifestations of PTSD; aggressiveness; depression etc. Actually, the internal factors of maladaptation are due to the peculiarities of the personal-adaptive potential of the participants of the anti-terrorist operation. In addition, ATO veterans have several typical symptoms that prevent them from adapting to peaceful conditions, in particular: increased excitability and irritability; unrestrained response to an instantaneous stimulus; fixation on psycho-traumatic circumstances; tendency to uncontrolled outbreaks of reactions to minor stimuli [2, p. 176].

Based on the analysis of the problem of personality maladaptation as a consequence of psychotraumatic influence, we proposed a model of psychological maladaptation of ATO veterans (Fig. 1).

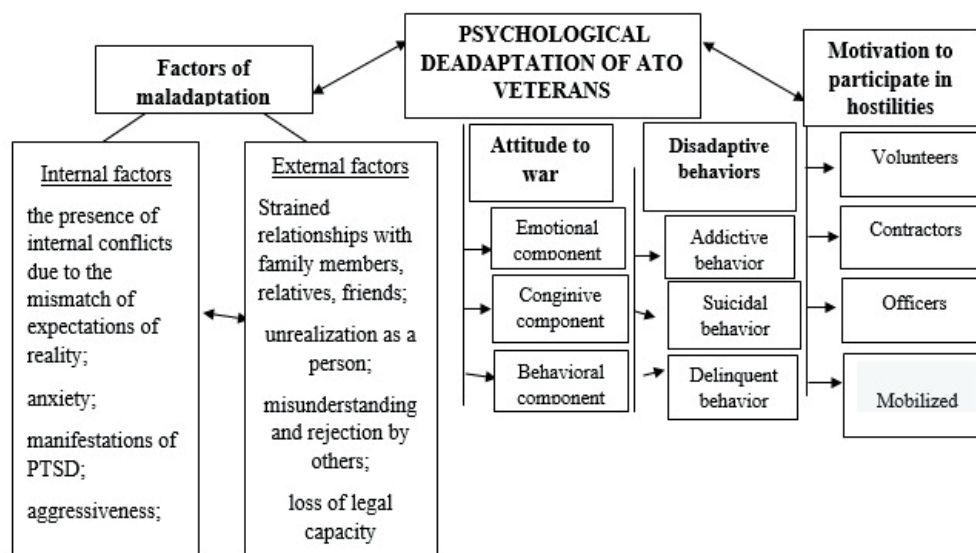


Fig. 1. Model of psychological maladaptation of anti-terrorist operation veterans

The majority of ATO veterans with PTSD symptoms have a sharply negative attitude towards social institutions and the government. And yet: mental breakdowns, cruelty, intransigence, increased conflict, on the one hand, fatigue, apathy - on the other - all these are the body's natural reactions to the effects of prolonged physical and nervous stress experienced in a combat situation.

External factors that lead to maladaptation include strained relationships with family members, relatives, friends; unfulfilled as a person; misunderstanding and rejection by others; loss of legal capacity. The range of effects of war on humans is extremely wide. At the same time, the softened and delayed consequences of the war are much larger, affecting not only the psychophysical health of ATO veterans but also their psychological balance, worldview, stability of value orientations [2, p. 176].

In addition to the above-mentioned factors, the attitude to the war influences the psychological maladaptation of anti-terrorist operation veterans. The emotional component is manifested in bipolar attitudes, where on the one hand veterans do not accept and deny everything related to the war, on the other - constantly remember past events, sometimes even feeling warm feelings about the "spirit of unity and brotherhood", which is absent or absent to such an extent in a peaceful life.

The cognitive component reflects one's perception of oneself as "someone on whom something depends," "who is not me," or one's perception of oneself as a person on whom nothing depends. The cognitive component of attitudes toward war is closely linked to the ability to take responsibility for one's own life and the lives of loved ones or to "infantilize" perceptions of reality and one's own life. This indicates that the perception and understanding of the meaning, role, and place in the war depend on the internal characteristics of the individual.

The behavioral component of the attitude to war is realized through excessive social inclusion, active social position, the image of a "noble hero", a defender. Thus, a significant number of ATO veterans are focused on generally accepted and socially acceptable norms of behavior, try to comply with corporate requirements, in everyday activities put group interests above personal ones, which indicates an altruistic orientation. However, for maladapted ATO veterans, these manifestations have the opposite direction. Yes, maladapted ATO veterans tend to think that their actions and thoughts are "correct" because they saw what others "did not dream of." Any insult or conflict situation in a peaceful life leads to inadequate, aggressive reactions, and any attempt to "oppress" their rights leads to "large-scale" actions.

Another structural component that significantly affects the manifestation of maladaptation is the actual motivation to participate in hostilities. It was found that volunteers are easier to adapt to peaceful conditions than mobilized anti-terrorist operation participants, because by deciding to voluntarily take part in hostilities, the presence of a desire to protect their country, a clear position in life, and ideology "protect" from some disappointments. Although, sometimes, volunteers are not fully aware of all the difficulties they may face, guided by "ideological romanticism". As for the contractors, their perception of the war is "refracted" through the prism of monetary reward,

respectively, their spent "living resources" will be compensated financially. However, none of these motivational manifestations can "protect" from the traumatic impact on the individual. In addition, in the case of injuries or loss of limbs, the perception of reality will depend more on the personal-adaptive potential of the individual than on his previous motivation to participate in hostilities.

Determining the features of psychological maladaptation of ATO veterans is not possible without analyzing maladaptive behaviors and their manifestations. Thus, one of the forms of maladaptive behavior is addictive behavior. Because the manifestations of PTSD and the inability to accept reality hinder adaptation to peaceful conditions, the easiest way to "blunt" experiences is to "drown" them in alcohol or drugs. Quite often, it is under the influence of various psychotropic substances and alcohol that ATO participants commit crimes, acts of violence or suicide. The latest manifestation of maladaptation today is very acute. So, today about one thousand participants of anti-terrorist operation committed suicide though concrete statistics on suicide remain "classified". Under the influence of PTSD, which is primarily characterized by mental instability, even the slightest loss and difficulties push a person to suicide; special types of aggression; fear of attack from behind; guilt for surviving; identification with the dead.

In addition, psychological maladaptation is the result and consequence of criminal behavior of anti-terrorist operation participants, the features of which are: the emergence and sharp increase in the number of war and state crimes (desertion, leaving the battlefield, surrender or leaving the enemy means of war, side of the enemy, etc.); the nature of violent, mercenary and negligent crime changes (other objects of encroachment, ways of committing crimes, motives, causes, and conditions). The brutality of war, the subjective reduction in the value of human life and health, produces violent crimes. Material difficulties related to combat conditions, weakening of protection of material values, security of the civilian population - all this contributes to the commission of mercenary crimes. Fatigue, alcohol consumption, increasing the saturation of sources of increased danger (weapons, military equipment) against the background of reducing the value of human life and health contributes to increased levels of reckless crime [4, p. 31].

Conclusions. Thus, the anti-terrorist operation in eastern Ukraine, the long stay in stressful, extreme situations has led to the fact that many young people who defended the territorial integrity of the country are unable to adapt or have serious difficulties in adapting to peaceful conditions. Many ATO veterans are characterized by manifestations of PTSD, inability to accept reality, obsession with past events, feelings of loss, and so on. In addition, veterans of the anti-terrorist operation, due to the ambiguous attitude of other citizens to them, misunderstandings of relatives have exacerbated maladaptation.

Features of psychological maladaptation of anti-terrorist operation veterans depend on many factors, in particular on internal and external factors; from attitude to war; motivation to participate in hostilities, maladaptive behaviors. Through the understanding of each structural component of the psychological maladaptation of ATO veterans, the content and specifics of the problem are revealed.

Prospects for further research in this direction are the research of features of

psychological support of veterans of anti-terrorist operation, directions and forms of social and psychological rehabilitation of veterans of anti-terrorist operation within the limits of rendering to them of psychological help.

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INDIVIDUAL-PSYCHOLOGICAL FACTORS OF CONFLICT OF ADOLESCENT BEHAVIOR WITHIN CYBERSPACE

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Annotation. *The article states that the process of learning and education, like any process, is due to the development of personality and interpersonal relationships and is impossible without contradictions and conflicts. Today's young people are integrated into the global digital space and, accordingly, are exposed to various threats and negative impacts associated with the development of cyberspace. Confrontation with adolescents, whose living conditions today cannot be called favorable, is a common component of school reality. Naturally, in the process of this interaction there are always difficulties, problems and contradictions. In this aspect, the methods of measuring the manifestations of internal conflict are defined, the appropriate set of methods of psychodiagnostics is presented and tested.*

The conclusions state that cyberspace, on the one hand, leads to the expansion of contacts, opportunities for exchange of socio-cultural values, generation and implementation of new forms of symbolic experience, development of imagination, intensification of foreign language learning and a number of other positive effects. can lead to "addiction", contributing to the narrowing of interests, departure from reality, obsession with computer games, social isolation, weakening of emotional reactions.

Keywords: *conflictogenicity of behavior, adolescence, cyberspace, intrapersonal conflict, psychological comfort.*

Formulation of the problem. The problem of human behavior in conflict - is one of the most important in the humanities, so the conflict as a subject of scientific research appeared in such sciences as sociology, social philosophy and psychology. Recently, the problem of conflict has been studied by such sciences as pedagogy, management, history, ethics, etc. Today's young people are integrated into the global digital space and, accordingly, are exposed to various threats and negative impacts associated with the development of cyberspace. The number of users of mobile phones and the Internet is constantly increasing every day, most of them are young people.

Improvement of information technologies creates conditions for effective development of modern society. Communication has become an integral part of people's lives in all areas of activity. Mobile phones, computers and the Internet, expanding communication, spatial and temporal boundaries, have opened up new opportunities for communication, education, work, leisure and creative self-realization. The educational activity of a teenage student is the environment that generates a large number of conflict situations, due to the very specifics of the specialist's relationship with the environment. Public life and the processes that take place in it, one way or another find their direct

reflection in the psychological and pedagogical process. Therefore, the educational activities of teacher and student, which are based on the system of human-human relations, there may be moral and ethical problems and conflicts. Modern forms of behavior, including conflict, occupy a significant part of our lives and require specific knowledge about the patterns of conflict interaction, the ability to manage conflict, make it constructive, the ability to control their emotions to harmonize the external and internal world.

Scientists R. Dahrendorf, G. Simmel, L. Kozier in their works considered the conflict as a natural characteristic of social relations. G. Simmel considered conflict as an independent form of interaction, which plays a very important, integrative role, because the conflict contributes to the stabilization and organization of society (Doskin VA, Lavrentyeva NA, Sharay VB & Miroshnikov MP, 2015).

The article discusses the need to conceptually understand the new security (cybersecurity) reality and to solve purely practical issues of streamlining internal psychological and pedagogical support, in general, the whole set of problems associated with the conflict of adolescents in modern cyberspace.

Analysis of recent research and publications. Psychological theories of conflict study focused on the person as a subject of conflict, as well as the psychological features of his conflict. Representatives of this approach (A. Adler, K. Horney, Z. Freud, K.-G. Jung) believed that the root cause of any conflict is personal, scilicet the conflict originates from the attitude and behavior of a particular person, whose actions are a consequence internal mental processes. Freud's psychoanalytic theory became the basis of the psychological approach to the study of conflict, according to which a person is in a state of constant internal and external conflict with others and the world at large. Accordingly, man has a conflicting nature, because he fights unconscious and conscious desires aimed at the same objects. They often have the opposite meaning, which explains the human conflict (Calvete E., Orue I., Fernández-González L. & Prieto-Fidalgo A., 2019).

Unlike S. Freud, K. Horney denies that conflict is inherent in man from birth. Studying the basic conflicts, she points out that human conflict is formed under the influence of the external environment, especially parents. A. Adler considered human behavior in a social context. The essence of man's conflict with society, the scientist saw in man's attempt to overcome his inferiority complex. K.-G. Jung created and proposed a typology of personality traits that include an explanation of some features of human behavior in a conflict situation (Farrell A. & Vaillancourt T., 2020).

The results of scientific research allow us to consider the phenomenon of conflict in three forms, such as: intrapersonal conflict, which is a collision between approximately equal in strength, but oppositely directed interests, needs, inclinations, etc.; interpersonal conflict, defined as a situation where actors or groups pursue incompatible goals and realize conflicting values, or at the same time, in competition, seek to achieve the same goal, which can be achieved only by one of the parties; intergroup conflict, when the conflicting parties are social groups that pursue incompatible goals and hinder each other in the way of their implementation. In fact, in this case there is a desire to specify the task

and consider only part of the problem in specific conditions of interaction (Garandeau C., Vermande M., Reijntjes A. & Aarts E., 2019).

In a virtual environment, teenagers seek to relax and abstract from the psychological problems of the real world, to release emotions, have fun. Virtual play space allows teenagers to realize a number of basic needs: in the game, entertainment, achieving the goal, self-development, development of positive qualities, courage, ability to overcome obstacles, defeats and failures; the need for respect and self-esteem, the need for autonomy, the protest against existing rules, the removal of social taboos; the need for dominance; the need for aggression and prevention of danger, etc. It is the refusal of interpersonal interaction that creates a real danger among adolescents to increase the level of conflict in the cyberspace of adolescents.

Summarizing the above data, we can say that conflict is a difficult and complex phenomenon, so to describe it it is necessary to identify a range of concepts that most fully characterize this phenomenon. For all the variety of interpretations of the conflict, all of them are united by the idea of the structure of the conflict, which M. Mirimanova defines as "a set of characteristics that ensure integrity, identity with oneself, difference from other phenomena of social life. Without these components of the relationship, the conflict cannot exist as a dynamically interdependent system and process" (Viznyuk I., 2017).

The purpose of the article is to substantiate the individual psychological factors of conflict behavior of adolescents in modern cyberspace. The hypothesis of the study is the assumption that one of the main causes of increased conflict in the subjective interaction during the educational process is intrapersonal conflict (as an individual-personal property of character) of adolescents.

Cyberspace is a virtual world based on a real material foundation and with real consequences of its "existence and development". Cyberspace is a very complex phenomenon that combines reality and virtuality, tangible and intangible, abstractness and reality (Forsberg C. & Horton P., 2020).

Adolescence is the age when there are serious changes associated with both physiological changes and mental health of the child. These changes are directly related to the period of puberty. This interval not only includes a radical restructuring of previously formed psychological structures, but also emerging tumors, laying the foundations of conscious behavior. This stage is characterized by negative behavior of the adolescent, disharmony in the formation of personality, there is protest against others, as well as aggression, unnatural anxiety, ruthlessness. Due to the complexity and contradictions in adolescence, there may be situations that disrupt the normal course of personality development, while creating the conditions for the emergence and manifestation of aggression and conflict.

Presentation of the main research material. To solve this goal and test the initial assumptions, the following methods were used: theoretical analysis of the literature on the peculiarities of conflictogenic behavior of adolescents in modern cyberspace, psychodiagnostic method "Internet Addiction Scale" by A. Zhichkina, questionnaire accentuation of character Leonhard-Schmischek Thomas (adaptation by NV Grishina),

methods of quantitative and qualitative data processing. The empirical basis of the study was MBOU Secondary School №120 in Kyiv. The study involved 60 8th grade students aged 13 to 15, including 36 girls and 24 boys.

According to the results of the analysis of increased conflict in adolescents, the main feature of these techniques is a feeling of psychological discomfort. Psychological comfort can be violated for various reasons: internal and external. There are always mood swings in life, but each person perceives these states differently and reacts differently to them. One is ready to face difficulties, take responsibility and make decisions, and the other can hardly tolerate even minor changes in mood and psychophysical tone. Such people have a low tolerance of frustrations (Viznyuk I., 2017). In this case, the main mechanisms of Internet addictive behavior are escape from reality and acceptance of "virtual" roles, hiding behind a virtual mask "nickname", inventing a perfect image, losing individuality (his "I"). And, accordingly, the psychological aspects of the mechanism of formation of dependence on cyberspace are based on the natural desire of adolescents to get rid of all sorts of problems and troubles associated with everyday life.

Analyzing the results, according to the psychodiagnostic method of "Internet Addiction Scale" by A. Zhichkina, we came to the conclusion that 46 subjects (54%) have Internet addiction, thirteen people (43%) were found to be prone to Internet addiction and only in one subject (3%) had no internet addiction. The results of this technique indicate that more than half of adolescents today have already formed an Internet addiction.

The next step of the study was to determine the relationships between character accentuations and behavioral strategies in conflict situations. Let's consider what strategy was chosen by teenagers with this or that accentuation (tab. 1).

Table 1

Correlation between the type of accentuation and behavioral strategies in conflict

	Hyperthymic	Dysthymic	Cyclothymic	Emotional	Demonstrative	Stuck	Pedantic	Disturbing	Flurried	Exalted
Rivalry	11	1	2	2	4	0	2	0	1	21
Adaptation	1	1	2	5	0	0	0	1	0	4
Compromise	1	0	2	4	0	0	1	0	0	8
Avoidance	1	5	3	2	0	0	1	0	0	2
Cooperation	2	2	3	2	2	0	1	2	2	3

According to the hypothesis, it was assumed to identify links between behavioral strategies in conflict with individual-typological properties using the Spearman correlation coefficient and the indicator of the level of statistical significance (r). The advantage of this method is that you can determine not only the strength of the interaction, but also the nature of the connection (direct or reverse).

A direct relationship shows that a high level of one measured quantity corresponds to a fairly high level of another measured quantity. The feedback, on the contrary, shows that the highest values of the first value correspond to the lowest values of the second measured value and vice versa.

Spearman's coefficients were calculated for each of the values according to formula (1):

$$r_s = 1 - \frac{6 \sum d_i^2}{(n-1)n(n+1)}$$

where r_s is the Spearman coefficient,

d_i is the difference of the respective ranks of X and Y,

n is the sample size.

After receiving the data, the empirical results were compared with the tabular ones. The connection is considered strong if $|r_s| \geq 0.7$, medium strength, if $0.3 < |r_s| < 0.7$ and weak if $|r_s| < 0.3$

Thus, the following conclusions can be drawn:

1. Rivalry in direct connection (namely with an increase in the index of one indicator increases in direct proportion to another) is with this type of accentuation, as:

- hyperthymic ($r = 0.89$, $p \leq 0.05$);

2. Compromise is directly related to this type of accentuation, such as:

- exalted ($r = 0.47$ $p \leq 0.05$);

3. Avoidance of feedback is with this type of accentuation, such as:

- cyclothymic ($r = -0.49$ $p \leq 0.05$);

4. The device is directly related to the type of accentuation, such as:

- cyclothymic ($r = 0.44$ $p \leq 0.05$);

Such a manner of behavior in conflict situations, as cooperation, was not correlated with any of the types of character accentuation. The most pronounced direct link was found between the hyperthymic type and rivalry, ie people who have a similar accentuation, are characterized by competition and the desire to pursue their interests to the detriment of others in conflict situations.

Drawing conclusions from the results of the study, we can say that mainly in the group do not show manifestations of aggressive behavior among adolescents, despite the large percentage of accentuated. They are characterized by high contact, talkativeness. In conflict situations, adolescents are both active and passive. If a controversial situation arises, it does not escalate into an open conflict.

Thus, we can conclude that the rivalry in a direct relationship (ie with increasing index of one indicator increases in direct proportion to another) is with a hyperthymic type of accentuation ($r = 0.89$, $p \leq 0.05$), a compromise in a direct relationship with exalted type ($r = 0.47$ $p \leq 0.05$), avoidance in the feedback is with the cyclothymic type ($r = -0.49$ $p \leq 0.05$), the device in direct communication is with the cyclothymic type

of accentuation ($r = 0.44$ $p \leq 0.05$). Such a manner of behavior in conflict situations, as cooperation, was not correlated with any of the types of character accentuation.

Thus, the hypothesis that there is a connection between the type of accentuation and the strategy of adolescent behavior in a conflict situation (internal conflict), namely: such accentuation as hyperthymism is associated with rivalry, exaltation is associated with the strategy of behavior "compromise", cyclothymic associated with avoidance and adaptation, confirmed. Thus, the basis of increased internal conflict of the adolescent is a destructive emphasis on his character and behavior.

That is why in the process of psychological and pedagogical support it is necessary to create such conditions in which it is possible to increase the activity of the adolescent. The main task of the teacher is to create certain pedagogical conditions that would activate the activities of adolescents in the organization of educational and leisure activities. It is desirable to entrust them to the organization of affairs, entertainments where speed, variety, ingenuity are required. Sports are especially useful. Among the most important sports are swimming, which reduces the excitability of the nervous system, and martial arts, which form the skills of self-control and self-discipline.

Conclusions. Thus, cyberspace, on the one hand, leads to the expansion of contacts, opportunities for exchange of socio-cultural values, generation and implementation of new forms of symbolic experience, development of imaginary processes, intensification of foreign language learning and a number of other positive effects. to "dependence", contributing to the narrowing of interests, departure from reality, obsession with computer games, social isolation, weakening of emotional reactions.

The individual psychological factors of conflict-generating behavior of adolescents in modern cyberspace include: the inability to tolerate dysphoria in everyday life, so the experience of positive emotions is compensated while in the game, where they receive euphoria and joy; inability to relax outside of virtual space, feelings of emptiness and irritation. Addicts show characteristic persistent negative mental states (anxiety, depression, dissatisfaction with others and themselves), associated with low self-esteem, low levels of autosympathy, self-esteem, self-interest, self-acceptance. Along with a high level of anxiety, adolescents are characterized by more pronounced manifestations of aggression and frustration. There is also emotional immaturity, which is expressed in the inability to express and accept their negative emotions. Note that addicts tend to use more unproductive emotional (emotional discharge, emotional suppression, obedience, self-blame, aggression) and cognitive (confusion) coping strategies, which may be due to low overall self-regulation, behavioral rigidity and low immaturity. .

The results obtained in our study do not cover all aspects of the problem under study. We see further prospects for the study in an in-depth look at the issue of Internet addiction in students and its psychosomatic consequences. It also seems appropriate to investigate the level of anxiety and emotional stress in people of different ages depending on cyberspace.

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MODEL OF FORMATION OF INFORMATION CULTURE OF FUTURE DOCTORS BY MEANS OF MATHEMATICAL MODELING

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Annotation. *The article reveals the urgency of the problem the future doctors' information culture formation. The formation model of the future doctors' information culture by means of mathematical modeling during studying such disciplines as "Medical informatics" and "Biological physics" is developed. For the obtained formation model of information culture of the future doctor by means of mathematical modeling the purpose of each of the blocks is substantiated, which reflects the underlying approaches, ideas, principles of construction and functional purpose, includes target, methodological, procedural, meaningful, resulting blocks subsystem and has its own structure that reflects the specifics of this element of the system and the peculiarities of its operation.*

Keywords: *information culture; information culture of the future doctor; formation of the future doctor's information culture; model; model of formation of information culture of the future doctor; means of mathematical modeling; target, methodological, procedural, substantive, resulting blocks.*

Problem statement. In making decisions when diagnosing a patient and choosing a method and technique of treatment, the physician should be guided by current medical scientific information and accumulated medical practical experience. In turn, to obtain a sound diagnosis, it is advisable to use the methods of mathematical statistics, which explain the patterns of distribution of indicators and guarantee the diagnosis using mathematical methods.

The need to form the information culture of the future doctor led to the inclusion into the educational program such training disciplines as "Medical Informatics" and "Biological Physics".

The specificity of the material of educational purpose and the peculiarities of the methodology of its teaching lie in the fact that it is focused on the formation of a fundamentally unified system of knowledge, skills and abilities. For example, computer software is used to master mathematical and statistical methods of data processing, and skills in working with medical information systems allow you to accumulate primary information to perform analysis. Accordingly, the teaching of disciplines of information technology and mathematical content should be considered in the context of the formation of information culture of the future doctor.

Analysis of current research. The relevance and practical value of pedagogical modeling in any study is primarily determined by the adequacy of the designed model of

the studied pedagogical object, as well as how well taken into account its basic principles of modeling, which practically determine the capabilities and type of model and its functions.

Their scientific value lies in the fact that they allow to model various pedagogical phenomena and processes, which also include the professional subjectivity of future doctors.

Such well-known scientists as S. Rubinstein, O. Leontiev, K. Abulkhanova-Slavskaya, L. Antsiferova, A. Brushlinsky, A. Osnitsky, V. Petrovsky, V. Slobodchikov, V. Tatenko, V. Shadrykov and others, who determined its methodological and theoretical foundations. Based on the analysis of their works, the following methodological conclusion can be made: subjectivity shows the active nature of human life, characterizes its creative nature, and emphasizes the value of his inner world as a subject of existence. Especially relevant are the methodological provisions of S. Rubinstein [5] on the subject, personality and their psyche, which formed the basis of the subject-activity approach in psychology and pedagogy. These ideas were further developed in the scientific works of K. Abulkhanova-Slavskaya and A. Brushlinsky.

Researcher A. Derkach rightly emphasizes that "subjectivity and professional subjectivity as qualities that belong to the subject from the standpoint of the subjective approach in acmeological research, man is seen as a subject of improvement mediated by acmeological technologies and self-improvement..." [2, p. 10].

The main manifestation of the subject of professional activity is the professional subjectivity of the specialist, as "an integral professionally important quality of the specialist, meaningful aspects of formation, which actualization and manifestations are determined by the typology and specifics of professional tasks, the nature of professional interaction and professional environment" [6, p. 131].

Conceptual ideas of modeling, theoretical ideas about models and methods of modeling in pedagogy are substantiated by Y. Babansky, V. Bezpalko, A. Bratko, T. Ilyina, L. Itelson, N. Kuzmina and others. There are scientific works on modeling, for example, on the problem of modeling the pedagogical process (N. Lazarev, V. Semichenko, etc.), the main approaches to modeling (system (O. Kustovskaya)); activity (O. Leontiev); synergetic (L. Danylenko, I. Pidlasy), subject-activity (V. Yagupov); innovative (L. Danylenko, R. Gurevich, N. Morse, V. Noskov, etc.); main competence types of the subjects of the pedagogical process (V. Bolotov, A. Dakhin, A. Gurzhiy, R. Gurevich, M. Kademiya, V. Yagupov, O. Yargin, etc.).

At the same time, the results of the analysis of scientific sources indicate a significant interest of researchers in the potential of modeling, including pedagogical (E. Lodatko [3], A. Semenova [6], V. Yagupov [7]). Thus, E. Lodatko emphasizes that the general scientific concepts of "model" and "modeling" are important and at the same time complex tools for pedagogy. First, they got into pedagogy from other scientific fields; secondly, they have such "features, the nature of which is based on the vagueness, vagueness of pedagogical concepts" [4, p. 11].

In connection with the above mentioned, the aim of the article is to develop a

structural and logical model of formation of information culture of the future doctor by means of mathematical modeling during the study of disciplines "Medical Informatics" and "Biological Physics".

Presenting main material. Analysis of scientific sources shows that the problem of pedagogical modeling of the formation of information culture of the future doctor was not the object and subject of scientific research.

Pedagogical modeling is a method of creating and then studying pedagogical models, ie reflecting the main characteristics of a certain pedagogical system (process, phenomenon) in a specially created object – in the pedagogical model. Thus, the pedagogical model is a mentally presented or materially realized system of pedagogical process, a phenomenon that adequately reflects the studied subject of pedagogical reality, in our case - the formation of information culture of the future doctor by means of mathematical modeling.

Under the model of formation of information culture of the future doctor we will understand holistic pedagogical process in which the set of approaches of training is directed on students' acquisition of certain knowledge, abilities and skills, and also on development of the student's personality as the future participant of professional medical activity.

The model of formation of future doctor's information culture characterizes educational activity that indicates the necessity of allocation of such structural structure (fig. 1): the purpose; components of information culture of the future doctor; stages of formation; organizational and pedagogical conditions; scientific and methodological support; levels of formation of information culture of the future doctor; criteria and level indicators; result.

Comprehensive analysis of the concept of the future doctor's information culture allows us to present it in the form of the following components: basic (informational and mathematical knowledge and skills); operational activities (skills and abilities to choose the means and methods of solving practice-oriented tasks that meet the specifics of the goals and content of the future doctor); motivational and value (attitude to the medical profession as a value, understanding of its significance for society and for their own professional growth).

The formation of the future doctor's information culture in the process of studying the disciplines of "Medicine Informatics" and "Biological Physics" is in the sequential implementation of the following stages: motivational-target; content-activity; effective and evaluative.

Creating a model of forming the information culture of the future doctor by means of mathematical modeling is based on the following criteria for determining the goal: motivational (the desire to organize the search and analysis of necessary information); cognitive (knowledge of basic mathematical and information algorithms, information retrieval and processing); activity (possession of methods of mathematization and informatization in the field of medicine); personal (analytical thinking, clinical thinking, sociability, mobility).

The effectiveness of the formation of the future doctor's information culture by means of mathematical modeling in medical freelance depends on a number of organizational and pedagogical conditions. In our research we use the following organizational and pedagogical conditions: theoretical substantiation and development of a model of formation of information culture of the future doctor by means of mathematical modeling; creation of the information educational environment of the medical university for formation of information culture of the future doctor; modeling of professional medical situations in order to form the information culture of medical university students; use of information and communication and Internet technologies in order to form the information culture of the future doctor.

Analysis and generalization of scientific sources makes it possible to identify features of the model of information culture of the future doctor by mathematical modeling, which, as research shows, must meet the following requirements: 1) be an ideal system, optimization for studying the formation of information culture of the future doctor by mathematical modeling; 2) basically have similarities with the original, and in some respects differ from the original; 3) in the study to replace the original; 4) provide the opportunity to obtain new knowledge about the original as a result of the study.

Thus, the main advantage of this model is the integrity of the presented information, which makes it possible to implement a synthetic approach in understanding the formation of information culture of the future doctor by means of mathematical modeling.

Thus, the formation of future doctor's information culture by means of mathematical modeling is a purposeful and specially organized pedagogical process, the main components of which are diagnosing, designing, practical implementation and monitoring of its formation as an integral part of their professional training in medical health care. Its pedagogical modeling allows to form a systematic idea of this psychological and pedagogical phenomenon – of professional subjectivity, gives the opportunity to see a new quality in the model representation, which brings to a high level of scientific reasoning and conclusions, and ensures the dissemination of research results.

Under the model of formation of the future doctor's information culture by means of mathematical modeling we understand the descriptive characteristic of this process which contains requirements concerning its structure and formation as integral professionally important quality, methodological approaches and principles, the basic stages, methods, techniques and means of its formation and diagnosis in obtaining medical education.

The external aspect of the future doctor's information culture is its role in establishing social and professional ties of medical and health professionals, in finding and determining their place in society, in the implementation of the function of the profession, which improves social comfort, socialization.

Based on the understanding of the information culture of the future doctor, its importance in professional activities, the main approaches and methods of formation and the role played in achieving this goal by the nature of interaction of vocational education, substantiated the need for training in medical freelance, the implementation of which will ensure success in solving the identified problem, in building and implementing an

educational model of forming the information culture of the future doctor.

The meaning of the personality-oriented approach is the development of personality, the formation of personal structures of consciousness. The student is considered as an equal partner, a subject of educational activity, the subject-subject interaction of all participants of educational activity – the student, the teacher, representatives of administration, the public is realized in training. The formation of personal structures requires action on the psyche, on consciousness through the creation of favorable organizational and pedagogical conditions, favorable information educational environment, "zone of interaction" of educational systems, their elements, educational material and subjects of educational processes, in which self-learning and self-development the necessary structures of consciousness due to the content of the information educational environment. The content of the information educational environment means not only the content of education, but also new educational complexes, innovative and traditional models, high-tech educational tools, as well as dialogical communication of educational subjects, which allows personal orientation of pedagogical action on the student.

Activity approach in learning – is the implementation of educational activities as a set of cognitive processes mediated by conscious reflection.

The conclusion for this for students and teachers is that the student learns the activities for the development of educational material, namely the action of clarifying its content and its further processing. The student's learning activities with the teacher will be successful if they are productive in solving creative problems and medical problems. In particular, they should form their information competence, as the ability to effectively use computer technology and ICT in their professional activities.

Let's turn to the innovative approach, which is used in medical education as an integrative personality-oriented and competency-based approach, one that ensures the simultaneous development of personal qualities and professional competencies of students. This is a contextual approach that has been developed for thirty years in the scientific and pedagogical school of A. Verbytsky.

Researchers A. Verbytsky and O. Larionov call contextual learning, "in which in the language of science and with the help of the whole system of forms, methods and means of teaching, traditional and new, in the educational activities of students consistently modeled subject and social content of their future professional activities" [1, p. 129].

The ideas of the contextual approach are carried out in the modular representation of the content of training aimed at forming the information culture of the future doctor, when mastering the training module occurs as solving problem situations that arise in the context of problem tasks covering the entire module content. Since problem tasks are developed in accordance with known models of thinking (behavioral model, Gestalt model, probabilistic and information-semantic model), their implementation requires the coordinated application of competency and personality-oriented approaches caused by the presence in the content structure of the creative component. abilities of future doctors, which requires a personality-oriented approach.

Problem tasks performing is designed for the formation of certain elements of

the information culture of the future doctor, for the harmonized with the competence approach, the use of personality-oriented and activity approaches in the context of mathematical modeling. We use a complex, systematic action to achieve the goal of forming a personal educational space, which metaphorically presents the necessary learning processes and information and communication channels. This approach is designed to independently solve problem situations, to develop creative abilities and purposeful educational activities to form the information culture of the future doctor.

As a result, the structure of the theoretical model of formation of information culture of the future doctor was determined by means of mathematical modeling, which is a system of interconnected structural and functional blocks consisting of purposeful (goals, objectives), semantic (organizational and pedagogical conditions of formation of information culture of future doctor, approaches and methods of forming the information culture of the future doctor), the result (indicators, criteria, levels), as well as system-creative connections.

Schematically described model is shown in Fig. 1.

Target block. The global goal is the social order of society for a high level of education of future doctors. The developed model allows personal and professional development of future doctors from the standpoint of the formation of information culture of the future doctor by means of mathematical modeling.

Methodological block. Contains the purpose, tasks, theoretical and methodological approaches, principles and organizational and pedagogical conditions of formation of the future doctor's information culture by means of mathematical modeling. Contains professionally-oriented, personality-oriented and communicative-activity approaches and principles, according to which it is necessary to build the formation of information culture of the future doctor by means of mathematical modeling. Includes organizational and pedagogical conditions for the formation of information culture of the future doctor.

The procedural block of the model of formation of the future doctor's information culture reflects educational and methodical maintenance, contains forms, methods, means of the organization of the educational process and stages of preparation of students.

Content block. The formation of the information culture of the future doctor requires the provision of methodological, semantic and methodological training in the teaching of medical informatics. Methodological formation of the information culture of the future doctor is provided in the context of application of personality-oriented, competence, activity, contextual approaches. The model uses the integration of the content of academic disciplines and the course of medical informatics, developed and implemented software for the formation of information culture of the future doctor. The main method of teaching is the problem method, which is the most suitable for the implementation of personality-oriented, competency, activity, contextual approaches to the formation of information culture of the future doctor by means of mathematical modeling.

The resulting block. Assessment of the level of formation of information culture of the future doctor is the sum of component assessments, which are determined by the following criteria:

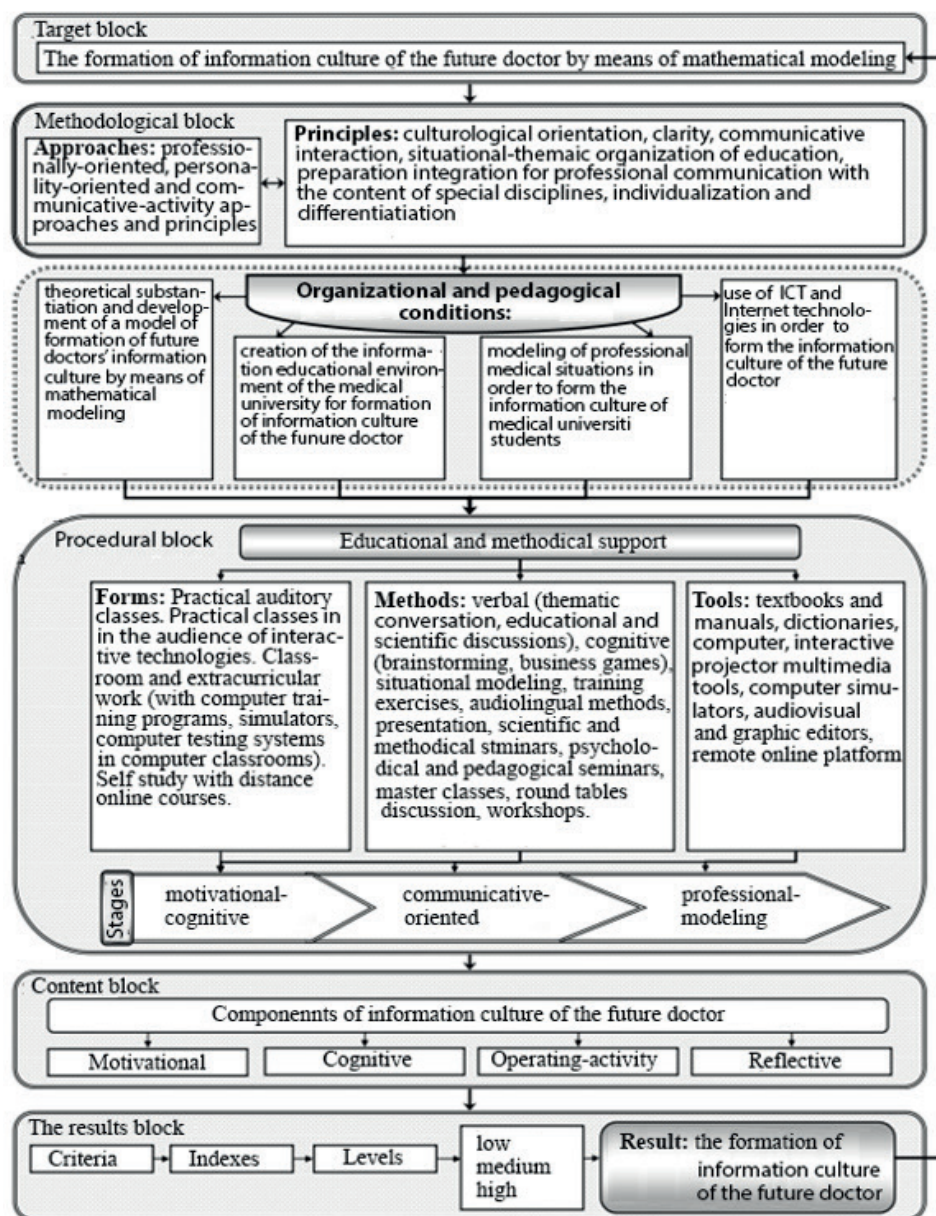


Fig. 1. Model of formation of the future doctor's information culture by means of mathematical modeling

Information criterion: understanding the essence and significance of information in the development of modern information society; the ability to collect, process and interpret using modern ICT data necessary to form judgments on relevant social, scientific and ethical issues; ability to use basic knowledge in the field of medical informatics

and ICT, skills in using software and working in computer networks; ability to plan information retrieval and use of Internet resources.

Technical and technological criterion: knowledge of the features of ICT, understanding of the operation principles, capabilities and limitations of technical devices designed for information processing; ability to troubleshoot computer problems and computer network operation; ability to operate modern medical equipment and facilities.

General physical criterion: ability to use information technologies of processing, analysis and synthesis of physical information; ability to understand, present the received physical information and present the results of physical research; readiness and ability to conduct research of physical processes on the basis of virtual experiments; development of breakthrough technologies with the use of ICT to solve problems in the medical field.

Creative criterion: the ability to assess the problem situation, identify its essence and find a way to solve it; development of creative personality qualities necessary for the development and implementation of informational medical projects.

Reflective criterion: awareness of their purpose in the information society; critical rethinking of the accumulated experience and improvement of the information skills on the basis of self-analysis; availability of results of development and self-development of the person concerning achievement of the maximum efficiency of professional medical activity.

Verbal criterion: knowledge, understanding, use of natural and formal languages, technical means of communication for the transmission of information from one person to another (verbal and non-verbal); ability to work both independently and in a team, manage people and obey.

The given criteria and indicators serve as initial data for definition of levels of formation of information culture of the future doctor by means of mathematical modeling.

Low level – a characteristic manifestation of certain components of the future doctor's information culture or certain indicators. Information activities are very limited.

Intermediate level – is characterized by active development of the components of the information culture of the future doctor. Productive information activities are possible.

High level is characterized not only by the intensive development of all components of the information culture of the future doctor, but also the transition to the level of self-education, self-improvement and self-realization.

Conclusions. The model of formation of future doctor's information culture by means of mathematical modeling in the information educational environment of medical higher educational establishments which reflects the approaches, ideas, principles of construction and functional purpose based on it, is a developed subsystem and has its own structure that reflects the specifics of this element of the system and the peculiarities of its operation. The developed model allows to identify system characteristics and intra-system integrative connections, as well as contradictions, the solution of which will ensure the most optimal development of the system as a whole.

The practical implementation of the model is carried out through the introduction

into educational practice of a specially developed multicomponent experimental program for the formation of information culture of the future doctor by means of mathematical modeling. The program is based on an additional invariant and option, the priority of practice and variability of programs of disciplines that enhance the training of future physicians in the experimental study.

Achievement of the goal of the dissertation research was facilitated by software and methodological support, which is systematic, ensuring the integration of theory with practice; intensifies student involvement in research, research and experimental activities aimed at mastering diagnostic and correctional and developmental competencies, creating a practice-oriented environment, which gives the future doctor the opportunity to choose an individual trajectory of development and work in medicine.

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THEORETICAL BASES OF PROFESSIONAL COMPETENCE FORMATION OF FUTURE SPECIALISTS IN THE TOURIST INDUSTRY

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Annotation. *The project activity is one of the main aspects of the professional activities of future masters of tourism studies and requires the need to develop skills in projects while studying in higher education institutions. The formed skills of work in the project and project management are the basis of successful professional activity in the field of tourism, because the tourist product is very volatile and requires timely response to various parameters and conditions that affect the performance of its performance. This is one of the main professional traits of a successful tourism expert.*

In article research substantiates the relevance and expediency of the chosen topic of research, defines its purpose, tasks and hypothesis of the research, its object, subject and methods of research, reveals scientific novelty, theoretical and practical significance, provides information about approbation and introduction of research results, information is provided on the publication and structure of the scientific work, on the basis of the study of domestic and foreign pedagogical and psychological literature on the preparation of future masters in tourism studies in The essence of tourism research and professional activity of future specialists in the field of tourism is outlined, the role of the project activity with the use of information and communication technologies in the work of tourism specialists is generalized, the current state of professional training of future masters in tourism studies is analyzed; the model of preparation of the future masters of tourism studies for the project professional activity is proposed; the organizational and pedagogical conditions for the preparation of future masters in tourism studies for design professional activities are determined and substantiated: use of informational educational environment for the preparation of future masters in tourism science, project management activities using modern Internet technologies, use of e-learning tools for studying technological bases of project activity, use modern software for monitoring project activities.

Keywords: *project activity, tourism, Internet technologies, information and communication technologies, economy of Ukraine, special competence.*

Problem statement. The role of the tourism industry in the development of the modern market can not be underestimated, as tourism has all the prerequisites for continuous improvement, based on historical, cultural, geographical, economic and other factors.

For further development and prosperity of the tourism industry it is necessary to link the financial, informational, human and software resources.

People involved in tourism, of course, must be highly qualified, providing quality services to meet the needs of consumers. Listening to the changing environment in the global and domestic tourism industry, it is necessary to meet the modern needs of the target audience and improve the professional qualities of professionals working in the

tourism industry. The need of entrepreneurs and scientists makes the tourism industry economically independent and attractive for investment due to the feasibility of analyzing the current state of training of tourism professionals and identifying ways to improve the training process.

The professional training in the field of tourism should be based on the application of a competent approach with the justification of special educational goals. This directly concerns the renewal and modernization of vocational training, improvement of educational activities aimed at the competitiveness of a specialist in the tourism industry, their adaptive qualities of behavior, readiness to solve any complexity of professional tasks. If the professional training of specialists is at the appropriate level and meets the quality criteria, then tourism specialists will be competitive not only in the domestic market but also abroad. Today, scientists highlight that the main task of higher education is to promote the necessary training and self-realization of professionals in tourism. Training should be carried out in combination with knowledge of the environment and interaction with natural factors. Considering today's specialists and their training in higher education, it can be argued that this system does not sufficiently meet the requirements of enterprises operating in the modern economy of Ukraine. Therefore, it is necessary to conduct research on modern principles that can influence the formation of professional competence of future professionals in the tourism industry.

The purpose of the work is to analyze the theoretical foundations and highlight the basic principles of formation of the professional competence of students, majoring in tourism.

The aim of the work is to analyze the theoretical foundations and highlight the basic principles of professional competence formation of future tourism specialists.

Analysis of recent publications. Taking into account the changing tourist market, there is a need to study the main factors of tourism development in Ukraine and, accordingly, the training of specialists in this field. This topic is constantly studied by both domestic and foreign scientists, such as: A. Akhlamov, A. Bazyliuk, I. Blagun, O. Beidyk [2], M. Boyko, V. Bratyuk, P. Hudz [3], T. Kotkova, V. Kifyak [4], O. Lyubitseva, L. Malik, G. Mokrytsky, M. Malska [5], V. Pestushko [6], N. Reimers [7], V. Tsybukh, L. Shpak [8] and others. Despite the large number of studies, there are still a large number of issues that are still open and require further research on the development of professional competence of future professionals in the tourism industry.

Presenting main material. It is not necessary to emphasize the well-known fact that in the world economy an important place is occupied by the tourism industry. If we talk about economic indicators, according to the WTO, the percentage of world GDP - 9%, export services - 30%, export services - 6%, more than 235 million people are involved in tourism. According to statistics, in 2015, 983 million consumers used the services of the tourism industry, and in 2017 there was a tendency to increase to the mark of 1 billion people [10].

There are many modern interpretations of the term tourism. Each scientist refines this concept and makes their own correctives. If we adhere to the Law of Ukraine

"On Tourism" of November 18, 2003 № 1282-IV, tourism is a temporary departure of a person from the place of residence for health, educational, professional, business or other purposes without carrying out paid activities in the place where the person from resides [1]. The tourism industry is attractive for economic and cultural development.

Analyzing the works of famous scientists, we can analyze the concept of "tourism" and make our own vision of this interpretation. Scientist Beidyk O. O. defines tourism as a form of travel and recreation in order to familiarize the environment, which can be characterized by environmental, educational and other functions [2]. Gudž P. V. considers the concept of tourism as an active recreation that can affect the promotion of health and physical development [3]. According to the scientist Reimers N. F., the interpretation of tourism has a concise definition, i.e. it is a trip to relax and get acquainted with new places and objects [7]. If we analyze the broader concept of tourism, the definition is given by the scientist Malska M., who believes that it is a type of recreation associated with going outside the place of residence; type of rest, during which efficiency is restored, the person recovers and explores the world [5].

These definitions show that there is no consensus on the definition of tourism. We adhere to the definition interpreted by the Law of Ukraine.

In order to effectively and efficiently provide services in tourism, it is necessary to form appropriate qualified personnel. Analyzing the educational services provided by higher education institutions, we can say that the formation of educational goals should take place not at the level of cities, states, but at the international level. Since the basic canons of education in the tourism industry are reflected in international instruments and conventions. During the accreditation and licensing of specialties in the tourism industry, it is necessary to pay attention to higher education to meet the needs of the international community.

It is clear that today, that only a specialist with a high level of knowledge, able to adapt to a changing environment and who is able to deeply analyze market situations will be able to be competitive in the tourism industry. And it requires learning to achieve professionalism in this field. For this it is not enough just to get theoretical and practical knowledge while studying disciplines, it is necessary to constantly improve, update knowledge taking into account modern trends required in the world [6].

To understand how the professional competencies of future professionals are formed, it is necessary to understand the meaning of the concept of "formation". In general, the formation is the process of becoming a person as a social part of society, taking into account various natural, economic, social, ideological, cultural, environmental, political, psychological factors.

After analyzing the work of domestic and foreign scientists, it is clear that they hold the same opinion regarding the acquisition of knowledge aimed at improving skills, competencies that will promote personal development. This person will be able to respond quickly to changes in the environment, the changing environment. When developing educational programs and, accordingly, curricula, it is necessary to realize the importance of selecting effective competencies. Not everyone understands what

competencies need to be formed in order to succeed in the future and a professional, qualified specialist [11].

The most important feature of a specialist in the tourism industry is the formation of professional competence, as a result of which you can become a professional. In general, professionalism is a holistic personal education, which includes a range of features of modern man [8].

A specialist who understands his job must have professional knowledge and skills and be able to apply them in practice while being able to think critically in different situations.

Professional pedagogical literature interprets competence as an integrated concept that expresses a person's ability to independently apply knowledge and skills in a given situation. Achieving a certain level of competence is seen as the ability to use and combine knowledge, skills and broad competencies depending on the changing requirements of a particular situation. That is, according to the level of competence, the specialist will be able to cope with complex unpredictable situations and changes [12].

In our opinion, the competence of a specialist is a combination of relevant knowledge, skills, practical skills, modern thinking, through which individuals can effectively make management decisions and carry out professional activities in general.

Scientists [1-12], who studied in their scientific papers the process of professionalism formation, identify the following types of competence (Fig. 1):

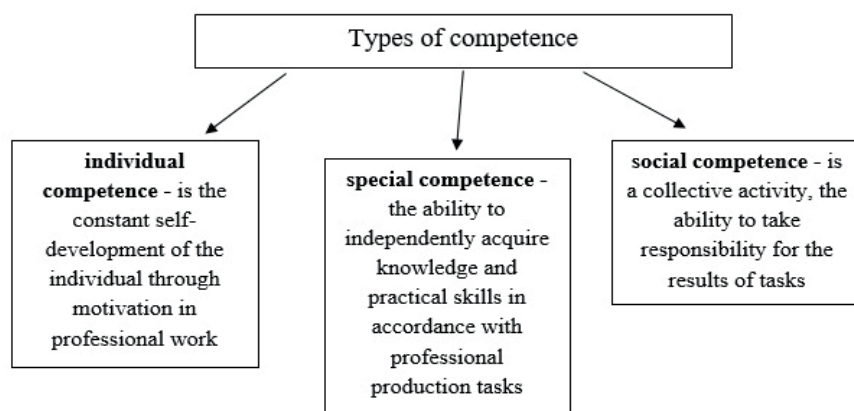


Fig.1. Types of competence [based on the sources 1-12]

First of all, it is necessary to understand that the basis for the formation of professional competencies of tourism professionals is to obtain appropriate theoretical and practical knowledge and skills. A person who aspires to become a professional in the tourism industry must be aware of the motives and values of the future profession. From the beginning it is necessary to form a theoretical basis and be able to apply the acquired knowledge in practice. Next is an awareness of the basic principles of professional

competencies, which will facilitate the study of professional disciplines. An important stage is the passage of introductory, training and production practices, through which the future specialist will be able to see the work and the main realities of work in real conditions. The final stage in the formation of professional competencies of a specialist in the tourism industry is the study of additional courses that can deepen knowledge and form a behavioral and emotional-volitional component of professional competencies.

It should be understood that the training of future specialists in the field of tourism should not be limited to obtaining theoretical and practical knowledge in classrooms. It is necessary to focus the attention of future professionals on extracurricular work, where there is a strengthening of socio-cultural orientation, information and communication technologies are used with the use of modern software.

Professional training of future specialists in the field of tourism is an important process of students gaining relevant special knowledge, skills and practical skills that will form a highly qualified, competitive specialist for the tourism industry.

Conclusions. The formation of professional training of specialists in the tourism industry is an integral part of the modernization of vocational education in Ukraine. Today, higher education needs to be improved, to move to a new level. The main attention should be paid not only to the acquisition of theoretical knowledge, but also to the development of personality, to teach to think and work in a new way, thus forming the professional competencies that the modern market needs.

It is clear that the training of tourism professionals should be based on the basic principles of the competence approach. To do this, it is necessary to introduce unique, innovative teaching methods into the educational process, to combine theory with real practice in enterprises, to attract experienced practitioners from enterprises to share experiences. The concretization of professional competencies for specialists in the field of tourism needs constant improvement and updating in accordance with the needs of the modern market. It depends on how much the future specialist will be a professional and competitive in the market.

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PHILOSOPHY AND THEOLOGY

HISTORIOGRAPHY OF CULTURE-BASED STUDIES: CHARACTERISTICS OF KEY AREAS OF CULTURAL RESEARCH IN FRANCE

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Annotation. *The aim of the paper is to characterize the evolution of culture-based studios in France. There are two vectors of cultural studies: the classical historiographic trend and the interdisciplinary trend. However, these trends have a common basis – they are implemented within the framework of social science. The results of the article can be used in further study of the features of cultural and culture-based studies.*

Keywords: *culture-based studies, cultural studies, multidisciplinary, interdisciplinarity, historiography, social science.*

The relevance of work. In the current socio-cultural life, France takes the position of the legislator of new trends in the humanities in general and culturology in particular. It should be emphasized that culturology in France is often considered in the context of social knowledge (and even the social sciences). Culturology (as a complex of cultural sciences in the broadest sense of the term) (la Culturologie, les Études culturelles, les Sciences de la culture) in France must be part of the system of social knowledge (les Sciences sociales – literally “social sciences”), so resources such as *Espaces Temps* and *Annales HSS* are the most recent trends in this field. Foreign researchers, as is well known, do not consider culturology to be a separate science: they consider it as part of a complex of social sciences. In the post-Soviet space, including Ukraine, culturology is an independent science. It is important to understand the place of culturology in the system of European, namely French, sciences.

Analysis of recent research and publications. Among the main researchers whose work we used in writing this article, the names of such scholars should be noted: P. Bourdieu, S. Carof, O. Danchuk, O. Ivashina, A. Kravtsov, R. J. Lawrence, G. Noiriel, J. Petts, S. Owens, H. Bulkeley, B. Tress, G. Tress, G. Fry. The works of these researchers are systematic and structured in nature, which meets our request since the logic of this article is based on the generalization of knowledge and the structuring of this knowledge.

The purpose of the article. To characterize the process of the formation of culture-based studies in France, showing the connection between cultural studies, culturology and culture-based studies with the field of social science.

Research methodology. General theoretical methods were used in the work: analysis, synthesis, generalization, induction and deduction. Among the specific methods characteristic of culturology, the article used synchronic and diachronic methods.

Historians and theorists of culture in the understanding of Western European scholars do not study the phenomenon itself, which has already been studied by other specialists (like historians), but the ways, mechanisms and models by which this phenomenon was disseminated, interpreted and, if possible, applied inappropriate practices. According to the Ukrainian researcher O. Ivashina, “theory as a self-vision of culture [but this opinion can be supplemented by similar statements about the history of culture] cannot be as problematic as culture itself” [5, 30].

The humanities shape the spirit of synthesis and criticism and fight against all forms of obscurantism. This is how current supporters of culturology and Kulturwissenschaften understand them. This also applies to French researchers. Thus, we can say that French thinkers who support critical intellectual exchange through such a constellation understand this direction of the humanities; they recognize it, outside of certain methodological shortcomings or certain deviations from the type of intellectual activity, theoretical skill or influence of hypersensitization.

Ways of studying culture (in the broadest sense of the word – as a way of human existence) change from era to era. In the XX century, the socio-cultural environment was influenced by the following factors:

- increasing globalization;
- strengthening competition from global and local trends;
- increasing the role of innovation and research [7, 643–656].

This list can be expanded. These key factors, respectively, influence the policy of France and Ukraine in the field of science. However, the approach to research in general and cultural research in particular in these countries is different. The structure of this article takes into account two important points:

1. The subject of this study belongs to the field of theoretical culturology. It, in turn, is formed based on sources. Among the most important sources of theoretical culturology should be noted in particular the philosophy and history of culture. In this case, this work is devoted to the study of cultural history as a source of knowledge about culture-based research in France. This includes the second half of the XX century.

2. In the XX century in cultural studies in France there have been several significant changes. They relate to two areas of intelligence within the science of culture:

a) the first direction is related to the preservation of the historiographical tradition of culture-based research in France;

b) the second direction concerns the tendency of multidisciplinary, which requires the adoption of other – different from historiographical – analytical approaches.

3. The place of culture-based research in France differs from the place occupied by Ukrainian culturology in the domestic system of sciences. Thus, in France, cultural research is represented by the following forms: la Culturologie, les Études culturelles, les Sciences de la culture. If Ukrainian culturology belong to the humanities (moreover, they are presented as a separate branch of science – №26), culture-based studies in France are more related to the social sciences. In Ukraine, the structuring of the sciences is determined by the Ministry of Education and Science, Youth and Sports. As for France,

science policy is determined by the Ministry of Higher Education and Research (Ministère de l'Enseignement Supérieur), as well as by individual universities. In addition, the so-called higher schools have a great influence. The level of decentralization of French universities is much higher than that of domestic universities.

The French Ministry of Higher Education and Research proposes the following structure of branches of science:

- biology and health (biologie et santé);
- bioresources, ecology, agronomy (bio-resources, écologie, agronomie);
- energy, sustainable development, chemistry and technology (energy, durable development, chemistry and processes);
- environment, planet, the universe (environment, planet, universe);
- space (espace);
- mathematics, physics, nanosciences (maths, physique, nanosciences), information and communication sciences and technologies (STIC), artificial intelligence (intelligence artificielle – IA);
- humanities and social sciences (sciences de l'homme et de la société).

To more clearly define the place of culture-based research in the French system of sciences, one should turn to the structuralist constructivism of the French researcher Pierre Bourdieu (1930–2002). In this article we follow the principle of double structuring of social reality, namely:

- a) the social system contains objective structures, independent of the consciousness and will of people, which can stimulate certain actions and aspirations of individuals;
- b) the structures themselves are created by the social practices of agents [2].

Constructivism – the second instruction of P. Bourdieu – in turn, assumes that people's actions are determined by life experience, the process of socialization, acquired skills and knowledge, the tendency to act in one way or another. The researcher calls this matrix of social action, which “form a social agent as a truly practical operator of object construction” [2, 28]. Such approaches make it possible to establish cause-and-effect relations between various social phenomena (especially in modern conditions of high competition and uneven distribution of social realities in space). Accordingly, the guidelines of structuralist constructivism help to identify the specifics of the formation of directions of cultural research in certain countries. In the context of this work, we are interested in France.

The theory of the field proposed by the French philosopher is logically connected with the instruction of constructivism. Thus, according to P. Bourdieu, the social field is a structure that can be logically thought of, a kind of environment where social relations are realized. However, we can also define the social field as real institutions: economic, political, social, and so on. Therefore, it is appropriate to apply P. Bourdieu's field theory to the study of the institutional structure of French science, as it is necessary to understand the place of culture-based research within this structure. For the French philosopher, the determining factor is not just the statement of the fact of existence of certain institutions, but the identification of objective links between different positions,

the interests of people involved in the activities of relevant institutions.

Therefore, the whole social space can be divided into fields, where we are particularly interested in the field of culture and the scientific field. With the help of the first field, the category of culture is postulated, with which cultural research works. For Western authors of the XX century, reflections on culture are built around key positions in the humanities as a whole. Thus, P. Bourdieu emphasized that Western concepts of culture are based on the guidelines of structuralism (the works of C. Levi-Strauss, R. Bart, M. Foucault), poststructuralism (the works of J. Derrida, J.-F. Lyotard, J. Deleuze), phenomenology (intelligence of E. Husserl and M. Merleau-Ponty). Since culture is at the centre of culture-based research, it is logical to determine the parameters of culture to which French researchers pay attention: in particular, the functions of culture, mechanisms of its accumulation, reproduction, translation, moral values and cultural unconscious. Culture-based research in France is conducted through the prism of social science, because the main goal of scientists – first, to identify the links and interactions of culture and society, and secondly – to differentiate the spheres of culture in different fields [4]. That is, the field of culture is a kind of transversal integrity.

The field of science and the field of culture can be called fields of symbolic production. According to P. Bourdieu, “the very functioning of the field of science produces and provides a specific form of interest” [1, 16]. The peculiarity of the field of science is that the researcher must constantly correlate political and scientific strategies. However, both the field of science and the field of culture have the same characteristics as other social fields. The following characteristics should be singled out: mechanisms of capitalization and dominance, competition and struggle, availability of strategies. The field differs from the system by permanent struggle (capitalization of certain legitimate means). The field of social sciences in general, according to P. Bourdieu, is less autonomous than the field of natural sciences: the social sciences are responsible for the “legitimate vision of the social world”, and therefore they are always politicized, which reduces their autonomy [1]. Thus, culture-based research belongs to the field of social sciences – that is, the sciences of man and society. Cultural studies – as belonging to the field of social sciences, to the field of symbolic production – are thus also politicized.

Let's take a closer look at the areas of cultural intelligence. The first of them concerns the traditional French science attraction to historiography. Research in this area is based on the work of the school “Annals”. As can be seen from the full name of the school – *École des Annales Histoire et sciences sociales* – this vector of research relates to two key areas: history and social sciences. Accordingly, through the field of social sciences, the school of “Annals” is connected with culture-based research. The origins of the *École des Annales* are to be found in Strasbourg: it all began in the late 1920s, with a meeting between two French historians, Lucien Febvre (1878–1956) and Marc Bloch (1886–1944).

What factors influenced the formation of the school “Annals”? First, it is a cultural flourishing that has left Europe at the turn of the century. Second, the humanities were strongly influenced by the sociology of Emil Durkheim at the time (1858–1917). At

the same time, positivist tendencies and the study of national history in the traditional – classical key – have been severely criticized. Thus, the sociologist François Simiand (1873–1935) opposes the French historian Charles Seignobos (1854–1942), the author of numerous methods of historical research. In particular, he condemns the three “idols of traditional history”: the political idol, the individual idol and the chronological idol [9, 47–61]. This epistemological discussion, which exposes the crisis of historical discipline, is deeply connected with the work of two people: Lucien Febvre and Marc Bloch, already mentioned.

Together, L. Febvre and M. Bloch participated in the *Revue de synthèse historique* (“Short Historical Review”), a scientific periodical founded by the French philosopher and teacher Henri Berr (1863–1954) in 1900. *Revue de synthèse historique* published works on intellectual history, epistemology, philosophy, sociology, economic, social and cultural history. The journal aims to “revive” reflections at the crossroads between philosophy, history of science and general history, encouraging research and exchange of questions concerning the basics of social sciences, resumption of research on the nature of science, development of new ways of intellectual history. Thus, the *Revue de synthèse historique* is devoted to the history of intellectual labour. This helps shed light on the scientific criteria of the social sciences. This magazine still occupies an original place in all international publications [11].

In the spirit of the geography of the French scientist Paul Vidal de la Blache (1845–1918), this journal defended the project of the “federation of the humanities” (*fédérer les sciences humaines*). History can no longer be created without the support of new disciplines, such as sociology, psychology or geography. In the 1920s, this project and the membership of researchers such as the French philosopher Maurice Halbwachs (1877–1945) and the French psychologist Charles Blondel (1876–1939) created a very fruitful interdisciplinary atmosphere at the University of Strasbourg.

But we can talk about the birth of the “Annals” school only a few years later when in 1929 L. Febvre and M. Bloch decided to create their magazine – the *Annales d'Histoire économique et sociales* (“Annals of Economic and social history”). Two historians are defending a new historical project that will change the perception of cultural studies. Their research more deeply breaks with traditional history. If traditional history is characterized by an interest in wars, battles, great and prominent people, the glorification of the nation, the thinkers of the school of “Annals” want to study the history of societies, not individuals. From now on, economic, demographic and social issues are the basis of historiographical research. Historians study, therefore, how people lived, worked and died in each epoch. Of particular interest to “analysts” are beliefs, ideas and customs. Thus, the study of mentalities initiated by M. Bloch in *Les Rois thaumaturges* (“Kings of Miracles”) in 1924, reached an unprecedented scale [3].

But this project of social history could not have been carried out without the contribution of other social sciences. Thus, the two historians sought to create some “global history” that would cover all key aspects – sociological, economic and demographic. This project will be the “business card” of the researchers of the school “Annals”. Although

most of the works of the *École des Annales* are dedicated to the medieval period, this does not mean that they have no interest in the modern era. They also explore modernity – through the prism of “analytical” methodology. These are pressing issues, not global economic and political issues, such as the crisis of the international financial system or Nazism. Thus, the magazine, according to L. Febvre and M. Bloch, was to be a tool that gives the keys to understanding the world. He quickly gained international fame and popularized the “Annals” school around the world. Researchers of the *École des Annales* still influence all generations of French and foreign historians, culturologists, social scientists and more.

Next, we analyze the trends characteristic of the development of historiography in the second half of the twentieth century. In the 1970s, there was a transition from the “new history” (*La Nouvelle Histoire*), which was formed in the depths of the school of “Annals”, to new rhizome trends, which began to focus on the study of social relations and structures. The outpost of the “Annals” school was the “Annals” magazine, which continues to this day. The beginning of this process was marked by changes in the subtitle of the “Annals” magazine:

- in 1929–1938 – “Annals of Economic and Social History” (*Annales d’histoire économique et sociales*);
- from 1939 to 1941 – “Annals of Social History” (*Annales d’histoire sociales*);
- in 1942–1944 – “Collections of Social History” (*Mélanges d’histoire sociales*);
- in 1945, the “Annals of Social History” (*Annales d’histoire sociales*) were published;
- in 1946–1993 – “Annals. Economy. Society. Civilization” (*Annales. Économies. Sociétés. Civilizations* (*Annales ESC*));
- since 1994 – “Annals. History. Social Sciences” (*Annales. Histoire, Sciences sociales* (*Annales HSS*)) [12].

New development, in particular, the journal received after 2000, when its scientific secretaries were:

- French writer and philosopher Jean-Yves Grenier (1898–1971; headed the magazine from 1994 to 2000);
- French historian Jacques Poloni-Simard (Jacques Poloni-Simard, headed the magazine from 2000 to 2007);
- French historian Antoine Lilti (b. 1972, headed the magazine from 2007 to 2011);
- French medievalist historian Étienne Anheim (b. 1973, headed the magazine from 2011 to 2018), holder of the Order of Arts and Letters.

Today, the magazine’s editor-in-chief is Vincent Azoulay (b. 1972). E. Anheim’s presidency led to the concentration of the interests of researchers in this area on social and cultural history, as well as on the epistemology of history and historiography. E. Anheim is, in particular, the head of the Higher School of Social Sciences (*École des hautes études en sciences sociales* (*EHESS*)) – a French research institute, which was established in 1975. Before E. Anheim, this institute was headed by representatives of the Annals: French historians Jacques Le Goff (1924–2014) and François Furet (1927–1997).

The urgency of addressing this topic is justified by the need to distinguish between “new history”, “new cultural history” (since the 1980s) and “critical turn” in the history of culture, as well as “methodical school” (Ch. Seignobos, G. Mono, Ch.-V. Langlois) based on the following positions:

1. “New History” (or “new historical science”): this trend is based in particular on the critique of Marxism and positivism, which first established the facts and then sought their confirmation; Representatives of the Annals School suggested an alternative: to turn history into a social science included in the cultural context. The “new story” must thus be total, problematic and human-centered. Representatives of the “new history” were primarily practitioners, so they avoided thinking about the patterns that may exist in the historical process, the role of the individual in history, and so on.

2. “New cultural history”: this area is represented, in turn, by “intellectual history” and “history of social practices”. In the middle of the XX century, historiography is experiencing a “cultural turn”. As a result, historical research has shifted to an interdisciplinary space. Globalization, inextricably linked to communication processes, has put new issues on the agenda for those who study similar processes in the historical dimension, including in the space of cultural and intellectual history. The term “new cultural history” appeared in 1987: it is associated with the name of the American historian Lynn Avery Hunt (b. 1945) and a collection of conference proceedings (held at the University of California) “French history: texts and culture”. Thus, historians and sociologists move away from the view of culture as a reflection of society or a superstructure and begin to consider it from an anthropological standpoint, including in the concept of “culture” both high culture and everyday culture (customs, values and lifestyles, natural ideas and people’s feelings, etc.).

3. “Critical turn”: this direction in Western historiography concerns, first of all, the reassessment of the values of historiography itself. The “critical turn” is related to both “new history” and “intellectual reaction” (according to E. Wallerstein) and stems from the confrontation between history and social science. It also takes into account the work of not only French researchers but also German and American.

4. “Methodical School”: this area is a classic of French historiography. The Methodical School, on the one hand, tried to distance itself from idealistic philosophy and positivism, but, on the other hand, using their methods. From the standpoint of the “methodical school”, history is a science that objectively reflects the past of mankind, but an individualizing science, that is, one that establishes specific facts and events. The founders of the Methodical School were Charles Seignobos and the French historian Charles-Victor Langlois (1863–1929). At present, in modern historical science, the theory and practice of writing history have distanced itself from the static history of norms and institutions in the direction of the history of social and cultural practices.

It is noteworthy that the year 1975 was marked not only by the opening of the Higher School of Social Sciences but also gave rise to another branch of the school “Annals” – “Espaces Temps” [13], which became the expression of the so-called “critical turn” (critique tournant). The second trend in cultural research is related to the “critical turn”:

the tendency to multidisciplinary and interdisciplinary.

Espaces Temps presents a constellation of values on which Western European research is based, namely: reflection and self-knowledge, relevance and urgency of the issue, severity of expertise, the need for cultural expertise, multifaceted work, openness, accessibility and universality of research results. Among the pressing issues, which, according to the representatives of les Études culturelles and théorie française, which had a significant impact on the field of French social knowledge, should be the focus of modern research, including the following: ideology, problems of hegemony and resistance, and also the question of identity and the process of forming large teams.

The dynamics of development of social in general and cultural knowledge, in particular, does not allow not to set the upper limits of “present”, so our further analytical work will be related to the study of processes that took place in the “crater” of cultural research from the second half of the XX century to the 2020 year. A special role in conducting cultural research in France today belongs to the following institutions:

École normale supérieure (ENS);

École des hautes études en sciences sociales (EHESS; the school was established on the basis of the Practical School of Higher Education) research – École pratique des hautes études);

Institut d'histoire du temps présent;

Université de Versailles Saint-Quentin-en-Yvelines (UVSQ);

Université Bordeaux Montaigne.

It should be noted that this list is not exhaustive. However, it is necessary to make notice about the “topography” of culture-based researches. Therefore, if we talk about the topography of culture-based research in modern French social science with a tendency to multi- and interdisciplinarity – the opposite trend towards historiography, we can map the following blocks:

- development of cultural research based on interdisciplinary intelligence based on project journals;
- further deepening of interdisciplinary, multidisciplinary and transdisciplinary methodology in the field of humanities;
- development of social sciences in the following areas: “culture”, “social sciences”, “history”, “religious studies”;
- deployment of “culture-based research” in the framework of intellectual discussion clubs (societies);
- development of social science in the French humanities in general.

The scientific novelty of the research. This article presents a comprehensive look at the trends that dominated the French humanities in the second half of the XX century. The combination of synchronic and diachronic approaches allows us to consider the formation of culture-based research in connection with the key trends in the development of society in general and humanities in particular. In addition, this article proposes to separate culturology, cultural and culture-based studies.

Conclusions. Consideration of the historiography of culture-based research allows

us to state that culturology, culture-based research and cultural studies are not identical to each other. In particular, the differences are related to the methodology used by these studies. The place of cultural research in the domestic system of sciences and the French system of sciences was also analyzed. Ukrainian culturology and foreign culture-based studies are also not identical. So, in Ukraine, culturology is a separate science, and in France, for example, culture-based research is an organic, but not autonomous, part of the social sciences. This is due to the history of the emergence and formation of culture-based research. So, culture-based studies in France today are associated primarily with multi- and interdisciplinary trends.

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THE ISSUE OF NATIONAL IDENTITY OF THE UKRAINIAN DIASPORA OF THE TWENTIETH CENTURY IN THE POLITICAL AND PHILOSOPHICAL STUDIES OF M. SHLEMKEVYCH

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Annotation. *The paper explores features of the national identity concept in the political and philosophical legacy of the Ukrainian diaspora thinker Mykola Shlemkevych. The topicality of the research is emphasized by the absence of modern studies describing the challenge of preserving the national identity of the diaspora from the standpoint of Ukrainian scholars of 20th century in emigration. At the same time, the relevance of M. Shlemkevych's studies lies in the attempt to provide practical advice to overcome the crisis of worldview. The article outlines a number of considerations by M. Shlemkevych, which can be used to strengthen Ukrainian state building and the nowadays state-diaspora relations.*

Keywords: *national identity, M. Shlemkevych, political and philosophical studies in the culture of the Ukrainian diaspora.*

Articulation of the issue. The search for affirming national identity that the Ukrainian society is underway in the new social and political reality dictates the need for re-thinking of discursive aspects of the political and philosophic practices of the Ukrainian diaspora as an integral part of the Ukrainian culture. Despite a diverse structure of the Ukrainian diaspora philosophic culture, the issue of national identity stands out.

An important assumption of our study is the possibility to use the achievements of the Ukrainian diaspora intellectual thought of the second half of the 20th century in the context of tackling social and political development problems of the modern Ukrainian society. In this regard, we suggest analyzing the political and philosophical heritage of Mykola Shlemkevych (1894-1966), a remarkable representative of the Ukrainian diaspora intellectual tradition.

At the core of M. Shlemkevych's political and philosophic idea lies an attempt to conceptualize the phenomenon of a «Ukrainian man», which he interprets from the perspective of national identity crisis. Thus, the concept of «the lost Ukrainian man» can be interpreted as one of the most detailed historiosophical study of national identity in the culture of the 20th century's Ukrainian diaspora. Furthermore, the article emphasizes specifically of M. Shlemkevych attempts to outline the issue of retaining the national identity within the diasporic environment. Therefore, in our opinion, M. Shlemkevych's studies are especially relevant today, when the process of state-building in Ukraine almost ignores the intellectual potential of the Ukrainian diaspora.

The purpose of the article is to clarify the essence of the study of Ukrainian identity in the political and philosophical heritage of M. Shlemkevych. Another aim is to establish

an ontological coherence and to find out the possibilities of applying certain ideas to solve modern problems of development of the Ukrainian society.

Analysis of recent research and publications. Today the issue of national identity in the diaspora's culture is emphasized within the culturological approach to studying the diaspora phenomenon. Within the contemporary Ukrainian science, it was outlined in the researches of N. Kryvda, I. Ohorodnyk, S. Rudenko, M. Rusyn and others.

Applying to the personality of M. Shlemkevych, we have to admit that both Ukrainian and foreign historiography lacks systematic studies of thinker's works. The first studies of his scientific and publicistic achievements appeared in the diaspora's writings of 1960-1980s. Various aspects of M. Shlemkevych's intellectual as well as public activities were covered in the publications of his contemporaries, including I. Vytanovych, O. Kulchytsky, K. Pankivsky, R. Savytsky, B. Tsymbalisty. As Ukraine got independent, the Ukrainian scientific environment experienced a turn of research interest towards the national philosophic tradition, which had been developed within the environment of Ukrainian emigration, feeling no burden of the Soviet ideology.

At the present stage, M. Shlemkevych's political and philosophical legacy became an object of interest among contemporary researchers: I. Dziuba, V. Horyn, O. Lishchynska, S. Svorak, V. Artyukh, O. Kendus, I. Koziy, V. Ponomareva, Y. Blazheevska, and S. Hirnyak. V. Gorsky, Y. Barabash L. Tarnashinskaya, M. Hrynenko and others. However, in our opinion, as of today the most complex contribution to the systematization of the scientific heritage of M. Shlemkevych is the dissertation of N. Lokatyr «Socio-political and scientific activities of Mykola Shlemkevych (1894-1966)» [5].

Meanwhile, M. Shlemkevych's views at the state of Ukrainian society in the diaspora as of the middle of the 20th century still keeps almost not researched as of today. At the same time, our assumption is that this aspect of the thinker's heritage is critical for understanding of his views on the issue of the Ukrainian national identity.

Research results. The national identity phenomenon became the subject of scientific interest in the 19th century. Thus, in the contemporary historiography, it is common to associate the issue of national identity with rapid processes of origination of nation-states, spread of movements for freedom from colonial dependence. In the context of a philosophic tradition, the problem of identity can be viewed as an attempt to revise the idea of a traditional narrative about the subject's identity to itself. As L. Nahorna notes, the notion of identity, being borrowed from psychology, turns in the philosophic as well as social and political thought into a universal tool to analyze the consciousness constructs of the prior century [8, p. 47]. Thus, the philosophical reflection on the problem of identity found its place in the works of Western philosophers of the late 19th and early 20th centuries, in particular M. Heidegger, K. Jung, J. Lacan, E. Erickson and many others. Later, the concept of the identity attracted the attention of postmodern philosophers: M. Foucault, R. Barthes, F. Guattari, J.-F. Lyotard, J. Deleuze, J. Derrida.

However, in the context of the diaspora's political and philosophic thought, the phenomenon of national identity was usually considered from culturesophic perspective. It was interpreted as the feeling of unity with a certain community, its symbols, values,

history, territory, culture, governmental and legal institutions, political and economic interests. In the context of our study, an important conclusion was made by M. Stepyko, a contemporary researcher of Ukrainian national identity. He points that in such scientific perspective the analysis of identity arises as the problem of its crises, which are analyzed as an indispensable stage of development of both a person and social institutions [10, p. 6]. In our opinion, it is a reasonable assumption that an idea of social progresses driven by the identity crises is inherent to the political and philosophic thought of the Ukrainian diaspora of the 20th century. Definitely, such ideas reflect social and political backdrop against which Ukrainian emigrant thinkers made their works.

The Ukrainian diaspora in the countries of political West was developed under the conditions of partial, sometimes even total disruption of bonds with its historical homeland. Social, political and economic trials gave rise to a political disunity of the Ukrainian diaspora. Alongside the challenges of cultural assimilation and dissemination in the communities of residence, the crisis of Ukrainian identity arose. The problem of national identity in the diaspora's intellectual tradition was especially challenging during 1950-60s. This situation reflected painful transformations experienced by the Ukrainian society in the first half of 20th century and during the World War II. The post-war wave of Ukrainian emigration resulted in not only the increase of the diaspora's numbers. An inflow of new ideas took place with regard to the ways of further struggle for Ukraine's state building, which manifested itself in the ever-growing interest in political and philosophic studies.

At the same time representatives of the diaspora's political and philosophic thought followed with much concern the development of large-scale anthropological experiment of the Soviet authorities – molding of a «Soviet man» by means of communist ideology, internationalism, Soviet patriotism and collective thinking. Under these circumstances, there arises an idea of «Ukrainian man» – a kind of antithesis as a response to the concept of «Soviet man» in Ukrainian SSR.

Representatives of various directions of scientific activity of the diaspora tried to comprehend the worldview crisis in which Ukrainians in exile found themselves as of the middle of the last century. Among them are sociologists (V. Kubyovych), historians (O. Pritsak, I. Lysyak-Rudnytsky), philosophers (O. Kulchytsky), ethnopsychologists (I. Mirchuk, V. Yaniv, B. Tsymbalisty), pedagogues (I. Honcharenko, G. Vashchenko) etc. However, the issues of self-identification and preservation of collective identity in the culture of the postwar Ukrainian diaspora were covered probably the most comprehensively in the heritage of philosopher, publicist and public figure Mykola Shlemkevych.

We consider it expedient to give a summary of M. Shlemkevych's biography. This will allow us to show the scientist's interest in the topic of the national identity.

M. Shlemkevych received philosophical education at the University of Vienna. In 1933 he became one of the co-founders of the Western Ukrainian political organization the National Unity Front – FNE («Front natsionalnoyi yednosti»). The organization operated in Poland and followed the tactics of legal opposition to the policy of «normalization»

carried out by official Warsaw during the mid-1930s on the issue of Ukrainian-Polish relations. According to N. Burachok, a researcher of social and political activities of M. Shlemkevych, the FNE members spoke in support of the ideological platform of «creative nationalism », but lost the competition for support among Ukrainians to the Organization of Ukrainian Nationalists [1, c. 403]. During this period M. Shlemkevych's journalistic activity was imbued with calls on the Ukrainian society to unite around single political force, creation of a single national movement, achievement of economic self-sufficiency, class solidarity, preservation of national identity. Thus, as we can see, the theme of consolidation of the socio-political life of Ukrainians became the leitmotif of M. Shlemkevych's activity in the 1930s.

M. Shlemkevych was the editor of a number of Ukrainian magazines and newspapers published in Lviv and Krakow until 1944. After the coming of Soviet troops he immigrated to Germany. There M. Shlemkevych found himself in the whirlpool of emigrant life. In particular, he takes care of the relocation of Ukrainians from West German camps to the United States, Canada and other Western countries for permanent residence. M. Shlemkevych moved to the United States in 1949. There he continued his public and journalistic activities, in particular, he founded the magazine «Letters to Friends» («Lysty do Pryiateliv»), which was significant for the socio-political thought of the diaspora [5, C. 94-100]. In our opinion, it was M. Shlemkevych's observations and experiences during the war and the post-war wanderings that became the breeding ground for his idea of a «lost Ukrainian man». Within the framework of the concept of the «lost Ukrainian man», M. Shlemkevych tried to cover the worldview crisis in which, according to the scientist, was Ukrainianness as of the mid-20th century.

In our opinion, M. Shlemkevych's interest in the issue of development of a «Ukrainian man» in the history and culture context was covered most comprehensively in the following works: «Ukrainian Synthesis or Ukrainian Civil War» («Ukrainska Synteza chy Ukrainska Hromadyanska Viyna» - 1949) [16], «Lost Ukrainian Person» («Zahublena Ukrainska Lyudyna» - 1954) [14], «Galicia National Identity» («Halychanstvo - 1956) [15].

When it comes to the issue of identity of Ukrainians in emigration, M. Shlemkevych's work «Lost Ukrainian man» attracts the most attention. It is not by accident that famous literary critic I. Dzyuba noticed that M. Shlemkevych has attempted to answer painful questions of the Ukrainian emigration's life: «...M. Shlemkevych is focusing on a political and moral crisis among Ukrainians, the loss of characteristics that enabled an adequate response to the challenges of the time» [3, p. 135].

M. Shlemkevych constructs his idea of a «Ukrainian man» through the prism of historical development of the national elite. M. Hrynenko, a researcher of M. Shlemkevych's scientific heritage, draws our attention to the thinker's interest in a history and culture aspect of the «Ukrainian man» rise: «...M. Shlemkevych raised the issue of the person's self-awareness and comprehension of its place within the society, he gave a psycho-ethnic profile of a contemporary Ukrainian and tried to find the scientific basis for a possibility of further civilized and democratic development of Ukrainian people» [2, p. 56].

M. Shlemkevych's idea of a «Ukrainian person» has three «worldview types» at its core. The scholar titles them after the names of prominent Ukrainian writers and thinkers of 19th century: «Hohol», «Skovoroda» and «Shevchenko-Franko». In M. Shlemkevych's interpretation, the archetypes of the «Skovoroda-type man» and «Hohol-type man» were formed during the downfall of the Cossack state – in the second half of 18th century. According to M. Shlemkevych, a «Hohol-type man» is a metaphoric description of the Ukrainian national elite (the so-called «leading stratum»), which after the loss of Ukraine's state is looking for the ways to adapt itself to a «strange, new world» [14, p. 20]. Finally, it gets alienated from the enslaved masses and their «truth». Unlike «Hohol-type man», the «Skovoroda-type man» «does not downgrade to the level of an old-world landlord», «does not fall down to mere dullness in abundance» [14, p. 20]. This type of a person fails to find its place in the new world of the Russian reality. After all, «Skovoroda-type man» escapes to its inner world.

A «modern Ukrainian man», as interpreted by M. Shlemkevych, is a «Shevchenko-type man», which arose «from the aspiration to create one's own new world using one's own sources and strength» [14, p. 21]. In his opinion, the new Ukrainian man initiates a «mental revolution» against the dogmata and traditional customs; it symbolizes the disruption of the patriarchal system. This person aspires for origination of a new society based on the «knowledge and justice» [14, p. 21]. The core of its worldview is science, its key driver being intelligence. At the same time, the new Ukrainian worldview does not break with religion and people's traditions. A political ideal of a «Shevchenko-type man» lies in the aspiration to initiate a free Ukrainian society within its state. In our opinion, M. Shlemkevych comes up with the image of a democratic republic. In his understanding, Ukrainians gave rise to the very type of a «state of freewill» in the crucible of the World War I: the Ukrainian People's Republic. «A freewill gave rise to the state but failed to retain it», - M. Shlemkevych wrote [14, p. 27]. On the wreckage of the 1917-1921 liberation struggle, a worldview crisis arises, which M. Shlemkevych interprets through the prism of a «split» of «Ukrainian man».

Actually, M. Shlemkevych believed that, the Ukrainian diaspora found itself in the post-World War II period in the condition of the lost social balance as well as due to the collapse of the struggle of 1917-1921. From his point of view, in the mid-20th century, Ukrainians were disorganized to a large extent. In a «Letters to Friends», M. Shlemkevych adds to the image of a «lost Ukrainian man» as follows: «It goes about the lost human being inside a Ukrainian, about the lost human individual inside him. Those who look closely at our life must note that modern temporary forms kill both our common human and intimate, ours – just ours, – individual. That is why, among the political, union and public «sheep»-members, we are looking for a human individual in its human links and in its personal depth» [13, p. 9].

This M. Shlemkevych's statement proves that the diaspora's image is interpreted by him from the perspective of the idea of a «lost Ukrainian man». As of today, M. Shlemkevych's opinions about the diaspora's national identity are still poorly researched. Meanwhile, they are especially interesting for us as the ones that include practical

estimates and recommendations. According to M. Shlemkevych, they would have to be a kind of *modus operandi* for the Ukrainian emigrant community. In our opinion, these thoughts of the philosopher are still relevant today, because Ukraine's state policy regarding the diaspora keeps being inconsistent and non-systemic.

In the article «Internal Emigration or New Society», M. Shlemkevych described the Ukrainian diaspora as a melting pot of diverse societies that were originating on the basis of the «vertical» (origin, religious convictions, political preferences) and «horizontal» (between strata with different levels of education and welfare) splits [11, p. 27]. The pre-war Ukrainian diaspora, at M. Shlemkevych's estimate, remained in the obsolete system of mindset coordinates, which it inherited from the social and political situation in Ukrainian Galicia of late 19th – early 20th centuries [11, p. 27].

Following the analysis of the diaspora's public life during the post-war years, M. Shlemkevych makes a deplorable conclusion: «there comes a new static era» [11, p. 28]. «The dynamic inflow of live ideas» gives its place to the desire of keeping the status quo by way of tactical agreements and cooperation with even ideologically opposite groups [11, p. 28]. As such, the Ukrainians living outside their homeland find themselves, according to M. Shlemkevych, in a position of making a choice: whether to join the «kind-of-turned-to-stone old-school organizations» or to become the «emigration in emigration» and get isolated within confined and disparate groups not capable to impact the change of discourses in the diaspora's social and political life at the given historical stage [11, p. 28].

M. Shlemkevych recognized that complex social stratification of the diaspora in combination with political fragmentation became the factors to have slowed down considerably the origination of totally new social and political institutions instead of disparate emigrant hubs. «Our political life, similar to the soil torn by drought, aspires and waits for the rain of new ideas and for the revision of obsolete forms», - the thinker wrote [9, p. 51]. As N. Lokatyr says reasonably, M. Shlemkevych and his coevals aspired to provide the Ukrainian community with the opinions free from political narrow-mindedness, democratic and humanistic opinions, consonant with the pluralism of the Western world (one cannot deny the decisive impact of adaptation to the Western democracy on the evolution of opinions of many emigrants) and at the same time turned to the inside of the Ukrainian agenda [5, p. 135].

According to M. Shlemkevych, any emigration is prone to living in the world of illusions. This may result in the alienation from the homeland not only in spatial terms, but also in mental ones. Such a situation may lead to the lack of links with the new world and, as a consequence, to the «loss» of the young generation and mental «death» of diaspora. M. Shlemkevych sees the worldview discrepancy and mutual misunderstanding between the two generations to be a deathly threat for the very existence of the society. In the existing situation, the scholar admits two possible scenarios: the young generation gets involved in the political ideas and movement route of the society or this process ends up, as its driver – senior and middle generations – will depart into eternity. Hence, M. Shlemkevych's considerations are full of concerns dictated by the threat of loss of the

Ukrainian national identity by the growing generation.

In search of a response to the above challenges, M. Shlemkevych comes up with three «responsibilities» of the Ukrainian diaspora. In his opinion these «responsibilities» will help Ukrainians within the diaspora to struggle successfully «the state of loss» and to give the appropriate impetus to the development of a civil society in Ukraine. According to M. Shlemkevych, the first «responsibility» relates to the development of Ukrainian science in the intellectual environment that is free from ideological restrictions. «Our first responsibility and obligation is to speak out the things that are not allowed in our Ukraine; to refute the lies that disseminate from time to time from there; and to make a work that will go over to future», the scholar wrote [12, p. 47]. It should be noted that, according to M. Shlemkevych, only documenting the processes, which occur in the homeland, is not enough – he calls for «...tactful, rigorous, but also friendly correction of what is happening there; provide assistance – because what's happening there is Ukrainian science; we have to provide assistance with a new methods, learned in the West, introduce things unknown, or forgotten, there...» [12, p. 47] - he concludes.

The second «responsibility» of the Ukrainian diaspora, from M. Shlemkevych perspective, arises to the «new homeland»: «...we (the Ukrainian diaspora – V.S.) are Americans and we are the West», - he writes [12, p. 48]. The scholar means here extending the knowledge of the current situation in Ukraine and Eastern Europe. M. Shlemkevych himself made a lot of efforts to trigger the development and activity of the Ukrainian Publicist and Scientific Institute. According to his definition, the Institute aimed to «contrast with that fake information of the world about Ukraine» [12, p. 48]. Together with the like-minded people, the scholar tried to oppose the false information about Ukraine's history and ongoing situation, which was distributed in the Western mass media, and made a lot of efforts to bring the Ukrainian issue up to date.

The third «responsibility», as interpreted by M. Shlemkevych, is actually the «responsibility to the Ukrainian emigration». The scholar called those representing the public and political movements within the Ukrainian diaspora for coordination of their actions. According to him, the Ukrainian society «...strives for ideology and program re-origination, for the update of its living» [9, p. 51]. To retain a community within the Ukrainian diaspora, M. Shlemkevych called for «investments in a person», primarily in the Ukrainian youth. In this context, the scholar believed in necessity to «wake up the feeling-based attitude to the Ukrainian history and culture» [9, p. 51].

M. Shlemkevych's ideas had a significant effect on the opinions of his contemporary peers within the emigrant communities. For example, Ivan Lysyak-Rudnytsky, in solidarity with M. Shlemkevych, believed the existence of the Ukrainian emigration to be a consequence of the abnormal condition, in which Ukrainians were in their homeland. According to I. Lysyak-Rudnytsky, the role of the diaspora was to be a kind of a mental bridge between Ukraine and the surrounding world. «The most efficient help we can provide to Ukraine is to reinforce and develop a robust Ukrainian social and cultural life in scattering», - he wrote [6, p. 455].

Thus, the study of culture and science works of the Ukrainian diaspora stimulates

the efficient development of the Ukrainian humanity science knowledge and makes it possible to comprehend the essence of the modernization processes in contemporary Ukraine from a new perspective.

Conclusions. The task of political philosophy in Ukraine today is to find out clear guidelines for the development of society and Ukrainian state building. This thesis makes reference to the issue of the Ukrainian national identity within the political and philosophical studies. In view of this, we assume that taking into account the results of the thought of the Ukrainian diaspora of 20th century should be an important factor in the study of Ukrainian political identity.

In our estimation, within the culture of the postwar Ukrainian diaspora the issues of national identity were covered in the most comprehensive way by philosopher, publicist and public figure Mykola Shlemkevych. As seen from our analysis of M. Shlemkevych's writings, his interest in the issue of national identity arose on the basis of extensive public and political activity intended for political consolidation of Ukrainians in emigration. In his studies, M. Shlemkevych tried to synthesize the worldview positions of Ukrainians, to make an inclusive concept of «Ukrainian man». An important feature of M. Shlemkevych's political and philosophic studies is the focus on a holistic image of Ukrainian identity through the prism of the idea of «Ukrainian man». M. Shlemkevych managed to describe accurately the Ukrainian society from a historical point of view and as of mid-20th century. He described his epoch as time of ideological disorientation, a split, a «mental breakdown» among Ukrainians.

Especially interesting are M. Shlemkevych's attempts to diagnose and describe the worldview crisis within the environment of the overseas Ukrainians, to re-comprehend the cultural and political mission of the Ukrainian emigration. In our opinion, the value of M. Shlemkevych's studies is in the attempt to give practical recommendations to overcome the crisis of national identity. That is why the conclusions made by the scholar in his publicistic as well as political and philosophic studies are especially relevant in today's Ukraine.

In the first place, worth attention are M. Shlemkevych's viewpoints with regard to the diaspora's role and position in the context of nation-state building. Despite that the scholar worked in the historical period, in which the idea of the Ukrainian state was solely a vision oriented to the future, his conclusions get even more relevant today – in the environment where the Ukrainian state building requires protection and development under the conditions of the external hybrid aggression.

As seen from M. Shlemkevych's works, which we have analyzed, he considers the Ukrainian diaspora as a resource to retain the national identity under the conditions of loss of the state. The scholar highlights the role that the Ukrainian diaspora may play in the context of making a positive image of the country in the world arena and building robust communications between governments.

The three «responsibilities» that M. Shlemkevych saw to be the program of activities exercised by the overseas Ukrainians of mid prior century, can, in our opinion, be re-comprehended in today's context and used with the intention to address the challenges

of state building. M. Shlemkevych's writings provide us with the vision of how to increase political, economic and cultural role of the Ukrainian diaspora in countries of their residence. It is the fact that the state's interaction with the diaspora opens up new opportunities to develop a positive image of Ukraine in the international arena. The Ukrainian diaspora's resource is also important in the context of making a favorable political environment for building a vibrant political dialog between Ukraine and the Euro-Atlantic Community.

In our opinion, M. Shlemkevych's views on the importance of educational work among the young generation of Ukrainians in the diaspora deserve special attention today. According to M. Shlemkevych, the youth policy in the diaspora should prevent assimilation and cultural dissolution of Ukrainians in their countries of residence.

In the face of a systemic crisis of the Ukrainian society and the need for modernization of all social life areas, hybrid warfare that Russia initiated against Ukraine, globalization challenges and modern civilization threats, it is reasonable to research the historical background, condition, problems and prospects of development of the Ukrainian national identity in the context of exercising the public governance. In our opinion, an effective way to extend the scientific discourse at the present stage of development of the Ukrainian political philosophy is to involve the intellectual heritage of the diaspora of the second half of 20th century.

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MEDICINE AND PHISIOLOGY

TESTICULAR CHANGES UNDER THE INFLUENCE OF CADMIUM IN COMBINATION WITH METAL SUCCINATES: MODERN VIEW OF THE PROBLEM (LITERATURE REVIEW)

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Annotation. *Now an increasing number of studies indicate that male fertility, primarily spermatogenesis and ejaculate parameters, is adversely affected by an increase in environmental pollution with hazardous technogenic toxicants, among which heavy metals, in particular, cadmium, occupy a priority position. Continuous sources of cadmium contamination are associated with industrial production, nickel-cadmium batteries, pigments, plastics and other synthetic products.*

Most research scientists believe that cadmium-associated disorders of the functional activity of the hypothalamic-pituitary-gonadal system in men are manifested by a violation of both hormonal regulation of the reproductive system and the functioning of the epitheliospermatogenic layer of the seminal glands, causing pathological changes in both the quantitative and qualitative composition of sperm. Cadmium induces lipid peroxidation and reduces the activity of antioxidant enzymes, causes degenerative and destructive changes in the spermatogenic epithelium, abnormal changes in the morphological structure of sustentocytes, thereby creating favorable conditions for disturbances in the morpho-functional organization of the blood-testicular barrier and spermatogenesis. Cadmium disrupts the development and function of interstitial endocrinocytes, induces damage to their genome, enhances apoptosis of Leydig cells and causes degradation of the seminiferous tubules, and weakens the expression of genes associated with the production of male sex hormone.

Keywords: *cadmium, cadmium-induced testicular changes, testosterone, reactive oxygen species, male infertility, spermatogenesis.*

Relationship of the publication with planned research works. The work was performed in accordance with the theme "Morphofunctional features of organs and tissues under the influence of external and internal factors", № state registration 0120U105219.

According to world statistics, in the current century the level of infertility, which continues to maintain its leading position as a priority in andrology and gynecology,

does not show a declining trend: now in different countries around the world 8-29% of couples suffer from this disease, and in Ukraine the share of infertile marriages reaches 20%. In 48-51% of cases, the cause of infertility is a pathology of the male reproductive system [1].

The causes of male infertility are complex, and its etiology in half of all cases remains unknown. Currently, an increasing number of studies indicate that male fertility, especially spermatogenesis and ejaculate parameters, is adversely affected by increasing environmental pollution [2]. Exposure to pollutants in the perinatal period leads to abnormalities of the reproductive tract - cryptorchidism, hypospadias (so-called testicular dysgenesis syndrome), which can initiate the development of subfertility or infertility in adulthood [3].

Therefore, the purpose of analytical research in the scientific literature is to identify data on changes in testicular morphology under the influence of cadmium salts.

Cadmium, along with arsenic, lead and mercury, is a class of heavy metals that is considered one of the most common toxicants in the environment. Permanent sources of cadmium pollution are associated with its industrial production, production of nickelcadmium batteries, pigments, plastics and other synthetic products [4]. Accumulation of cadmium in the human body can cause numerous adverse effects, including renal and hepatic impairment, pulmonary edema, osteomalacia, testicular, adrenal, and hematopoietic damage [5].

Cadmium-associated disorders of the functional activity of the hypothalamic-pituitary-gonadal system in men are manifested by a violation of both hormonal regulation of the reproductive system and the functioning of the epitheliospermato-genic layer of the seminal glands, causing pathological changes in both quantitative and qualitative composition of sperm [6].

Testicles (testes) - male gonads, in the parenchyma of which secrete tortuous seminal tubules, delineated by its own shell (spermatogenic compartment), and the interstitium located between them (steroidogenic compartment of the parenchyma). Representatives of the spermatogenic epithelium are Sertoli cells (CS), or sustentocytes, which perform a supporting, barrier, trophic, phagocytic, secretory, coordinating function and participate in endocrine relationships. Interstitial endocrinocytes, or Leydig cells (CL) in the steroidogenic compartment of the parenchyma produce male sex hormones (testosterone and its derivatives) and peptide hormone - insulinlike factor 3, which affects the differentiation of embryonic receptors in Leydig cells. inguinal region of the abdominal cavity and causes their initial omission [7].

Cadmium affects the development of Sertoli cells in both the fetal and neonatal periods. Exposure to cadmium (1-2 mg / kg) in pregnant female rodents can cause vacuolation of sustentocytes and loss of gametes in the spermatogenic epithelium of adults, inhibit proliferation, induce apoptosis and DNA damage of immature CS [8]. Sertoli cells in adults are also highly sensitive to cadmium: for example, rats treated with a single dose of 3 μmol / kg toxicant show vacuolation in the cytoplasm of sustentocytes and fragmentary condensation of chromatin in late spermatids [9]. The results of

research in the field of molecular biology indicate that cadmium causes changes in the cytoskeleton of KS-actin by influencing the expression of actin regulatory proteins Arp3 and Eps8 in vitro [10].

The "target" of cadmium toxicity is also the hematotesticular barrier (GTB), which in mammalian testes delimits the area of specialized contact between neighboring Sertoli cells of the basement membrane in the tortuous seminal tubules. Cadmium "attacks" GTB, causing defragmentation of actin sustentocytes in rodents and humans, and disrupts its function by affecting the activity of transforming growth factor β 3, which, in turn, induces the transmission of p38 kinase signals MAPK - an important component of the cascade of mitogenactivating proteins [11]. The toxic effect of cadmium on the hematotesticular barrier is also realized due to its effect on focal adhesion kinase - nonreceptor protein tyrosine kinase of GTB regulation, which alters the activity of proteins, in particular, occludin and ZO-1, in the testes [12].

Cadmium also has a negative effect on spermatogenesis. The results of research by the author's team under the leadership of Cupertino MS et al. (2017) showed that male rodents that were exposed to the toxicant daily (0.67–1.1 mg / kg) for 7 days demonstrated disorganization of the spermatogenic epithelium of the tortuous seminal tubules [13]. According to Nna V.U. et al. (2017), after four weeks of oral administration of cadmium at a dose of 5 mg / kg, the number of sperm, their motility and viability for 28 days were significantly reduced [14].

The toxic effect of cadmium is manifested in relation to the activity of mature sperm: as noted by Zhao et al. (2017), after treatment of human and mouse sperm in vitro with this toxicant significantly reduced its motility and significantly reduced the rate of in vitro fertilization of the egg and delayed early embryonic development in mice, suggesting the epigenetic effect of the toxicant [15].

Strong evidence of a correlation between high cadmium levels in semen and male infertility was provided by a metaanalysis by Zhang Y. et al. (2019) [9]. Analysis of the causes of infertility (501 cases) in Rockville, United States, showed the presence of abnormally high levels of toxicant in the serum of adult men of these couples [16]. An assessment of urinary markers of oxidative stress, sperm quality, and arsenic, cadmium, and lead levels in the urine of 1,020 men was performed by He Y. et al. (2020) indicates that high concentrations of these toxicants adversely affect sperm quality, but show a positive correlation with elevated levels of oxidative stress markers [17].

Cadmium also causes pathological changes in the male endocrine system. Thus, Chen C. et al. (2016) reported that there is a positive correlation between the concentration of cadmium in the blood and the level of SHBG (Sex hormonebinding globulin) - a globulin that binds sex hormones [18]. Kresovich J.K. et al. (2015) based on the results of the analysis of the male population (according to the National Health and Nutrition Survey (NHANES) 1999-2004 on the content of cadmium and SHBG in the blood) also found that the concentration of this toxicant in the blood is positively associated with SHBG [19].

The authors of a number of experimental studies have established the mechanisms

of cadmium-induced endocrinocyte-damaging effects associated with the toxic effects of cadmium on interstitial Leydig cells (CL) in the steroidogenic compartment of the parenchyma. It is known about the existence of two populations of CL in rodents: Leydig fetal cells (FCL) and adult Leydig cells ("adult" CL, DCL). Shima Y. et al. (2015) note that FCLs undergo apoptosis over time and gradually disappear, although some of them persist in the "adult" testis [20].

They play an important role in the development of the male reproductive tract, producing male sex hormones and insulinlike factor 3 (IPF3). Testosterone promotes the development of both internal and external genitalia of the male fetus, the development of the Wolffian duct and the vas deferens, and IPF3 causes the initial lowering of the testicles, regulating the shortening of the gubernaculum [21].

DCLs appear at the end of the second week after birth in mice and rats and increase the expression of some CL-steroidogenic enzymes, in particular the cytochrome P450 side chain cleavage enzyme (Cyp11a1) and 3 β -hydroxysteroid dehydrogenase. In addition, DCLs also increase the expression of luteinizing hormone receptor, highdensity lipoprotein receptor (Scavenger receptor class B type 1, *Srb1*) and steroidogenic acute regulatory protein (*StAR*) [22].

Cadmium has an adverse effect on the development and function of DCL. In particular, the results of research by the author's team led by Wu H. et al. (2017) showed that in adult male rats exposed to cadmium 0.5 or 1.0 mg / kg, there was a significant delay in CL regeneration, lower testosterone levels and regulated decreased expression of *Srb1*, *Star*, *Cyp11a1* and *Cyp17a1*. Subsequent in vitro studies have shown that cadmium also reduces the synthesis of male sex hormone and DNA integrity of Leydig cells [23].

There is growing evidence that the mechanism of Cd-induced male fertility disorders is related to the production of reactive oxygen species (ROS) in the testes. ROS homeostasis is supported by the production of hydroxyl, peroxy and hydroperoxy radicals, etc. and an antioxidant defense system. Violation of this homeostasis also leads to oxidative stress, which interferes with the development and functioning of sperm and somatic cells or induces their apoptosis [24].

Cadmium induces ROS generation in the testis. Exposure to the toxicant at a dose of 6.5 mg / kg on adult rats for 5 days initiates oxidative stress, causing increased lipid peroxidation and decreased levels of catalase, superoxide dismutase (SOD), glutathione peroxidase and glutathione reductase, thus glutathione reductase, thereby associated X-protein and tumor necrosis factor- α and weakening the expression of the antiapoptotic gene *Bcl2* in the testis [25].

Mahmoudi R. et al. (2018) noted that in rats exposed to cadmium at a dose of 1.5 mg / kg for 13, 25 and 39 days, there was an increase in ROS production, narrowing of the tortuous seminal tubules, a decrease in spermatogonia, sustentocytes and Leydig cells, and also reduced motility and sperm count and inhibition of testosterone synthesis [26].

The effect of cadmium on adult male rats after administration of a single dose of 2 mg / kg during the day induces ROS generation and reduces the activity of superoxide dismutase and catalase in the testis, thereby destabilizing the hematotesticular barrier

and ascorbic acid, which can cause inhibition of activation of transforming growth factor β 3 and phosphorylation of p38 MAPK kinase. It was also shown that rats exposed to the toxicant 3 mg / kg once a week for 28 days developed narrowing of the tortuous seminal tubules and depletion of sperm, an increase in multinucleated giant cells and degeneration of Leydig cells on the background of abnormally low activity. superoxide dismutase, catalase and glutathione [27].

The in vitro system also reliably demonstrates the ability of cadmium to induce ROS production in various testicular cells. An in vitro study of the KS germ cell subculture has shown that cadmium-induced oxygen formation reduces glutathione levels, causing cytochrome c release, caspase-3 activation, and Sertoli cell apoptosis [28].

Exposure of 10 –160 μ M cadmium to Leydig cell-derived rat R2C cell tumors also caused mitochondrial damage and decreased Star expression for 24 hours, after which it inhibited steroid secretion, presumably by increasing ROS levels and decreasing SOD2 activity [28]. In addition, the toxicant effect on Leydig cells of TM3 mice was manifested by a decrease in the activity of SOD2 and glutathione in the redox-sensitive Nrf2 / ARE signaling system, which plays a leading role in maintaining intracellular homeostasis under oxidative stress, thereby inhibiting production.

Although interesting epigenetic effects after cadmium exposure are observed primarily in the germ line [15], environmental-induced epigenetic changes associated with infertility are also described in somatic cells (including Sertoli cells and Leydig cells) that support spermatogenesis.

Given that the key mechanism for the development of cadmium-induced testicular injury is associated with the production of reactive oxygen species, all antioxidants, in particular vitamin C [27], vitamin E, *Fragaria ananassa* extract [25], cyanidin-3-O-glucoside [28], quercetin [14] and green tea [26] should partially or completely eliminate gonadotoxic effects mediated by the negative effects of cadmium.

Conclusions. Thus, the connection between the accumulation of cadmium in the body and the state of reproductive function of men deserves special attention, because the problem of male infertility with each passing year acquires special medical and social significance around the world. The accumulation of the toxicant in the testes and prostate gland is manifested by a violation of both hormonal regulation of the reproductive system and the functioning of the epitheliospermatogenic layer of the seminal glands, causing a deterioration in the production of quantity and quality of sperm.

Prospects for further research. A promising direction for the prevention and correction of the manifestations of Cd-induced testicular changes can also be considered the search and further use of cadmium bioantagonists. A prerequisite for this assumption is the results of the work of a number of Ukrainian scientists, who proved the modifying effect of metal succinates on embryotoxicity and cardiotoxicity of cadmium salts in the experiment.

Given the above, experimental study, analysis and evaluation of the spectrum of morphological changes in the testes induced by cadmium accumulation, and the search for new bioantagonists to prevent and correct the manifestations of cadmium-induced

testicular changes, we considered relevant and promising direction of further research.

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THE INTRODUCTION OF INNOVATIVE TECHNOLOGIES IN THE REMOTE PRESENTATION OF THE MATERIAL OF PRACTICAL CLASSES IN A MEDICAL UNIVERSITY

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Annotation. *The experience of introducing innovative technologies for presenting material in practical classes at a medical university is analyzed in order to identify the best methodological approaches in further practice of distance education.*

Keywords: *distance education, practical training in a medical university, innovative technologies in higher education, modern pedagogy of higher education.*

Formulation of the problem. The current situation, which has developed under the influence of the global pandemic, has had a significant impact on the restructuring of the pedagogical process at the university. This disrupted the structure of regular education and the standard methods that we have adapted over the years. Today, the academic community of the education system recognizes that an important and promising direction of its development is the widespread introduction of distance learning methods based on the use of modern pedagogical, promising information and telecommunication technologies. [1]. The university education system should respond flexibly to new factors and carry out the educational process using modern information and communication technologies that allow students to study educational programs without leaving their location without wasting time during the academic year [2].

The challenge, however, is not only about changing the way that information is conveyed face-to-face online. The real challenge is to create a culture that supports the introduction of innovative methods that require different skills and competencies from the teacher, student, administrator, while maintaining and improving the quality of education. [3]. Professional competencies, which are mandatory in the study of medical disciplines, are laid down in the developed and licensed educational programs of the university. The competence-based approach presupposes a new role for the student in the educational process: from a passive consumer of knowledge, he must become an active creator of knowledge, capable of thinking critically, planning his independent work, showing initiative, formulating problems and finding solutions, including in non-standard situations. In the learning process, students should not only acquire certain knowledge, but also be able to apply it in a specific practical situation. Therefore, the conduct of practical exercises must correspond to it.

The modern development of information and communication technologies allows medical universities to establish an active process of distance learning [4]. At the same time, the experience of using certain educational formats of distance learning that can be applied in the work of medical universities in teaching fundamental disciplines is gaining great importance [2].

Analysis of recent research and publications. The analysis of scientific and methodological publications of recent years on the issue of distance education at the university has a double assessment, with its pros and cons. The main advantage of the authors in the articles is the following: availability. Studying remotely, you can gain knowledge from anywhere in the world wherever there is Internet: [2, 5, 6],

- flexibility. In the process of distance learning, the student masters most of the material independently. In addition, this form of education can be combined with work, given that most students combine study with work. Online study times can be adjusted to suit the work schedule [7],

- mass character. Independence from the size of the audience and the possibility of one-time training of an unlimited number of students [6],

- opportunity for people with inclusion. People with disabilities can study at a college or university, master modern, in-demand professions without leaving home, find work in the future and improve the quality of their life [8],

- saving money and time for travel. Learning remotely, a person does not depend on transport [9],

- specific knowledge. In the course of distance education, the student has limited time to communicate with the teacher, which is spared from the excesses of academic education and is maximally used to obtain specialized knowledge [10],

- the relevance of knowledge. The student, due to the additional time that has appeared, has more chances to apply knowledge in practice than the one who studies abstract information that is not applicable in real life [11, 12],

- use of interactive. Maintaining a high interest of students in learning when using interactive techniques in the educational process, new educational technologies [9],

The disadvantages of distance learning are:

- impossibility of practical training. In the case of gaining practical experience and practicing practical skills, one cannot do without the guidance of an experienced specialist, such as studying disciplines at a medical university [4, 5, 11],

- lack of control. Distance learning requires high motivation and responsibility from the student. Lack of verification and control makes it difficult to fully immerse yourself in the learning process, especially if lectures are recorded [13],

- lack of personal communication. Informal communication with teachers, senior students and classmates can form an expanded understanding of the subject, develop new ideas, gain additional knowledge and practical experience [9, 13],

- no positive "side effects". By studying remotely, the student does not receive other positive benefits of an academic education. For example, the process of taking notes of long lectures trains your writing speed, develops mechanical memory, teaches you to

isolate the most important fragments from the flow of information on the fly [1],

- narrowing of horizons. The focus only on the subjects necessary for professional development limits the development of a person's personality, since due to additional subjects, a person's outlook expands, the skills to think logically and figuratively appear [13],

- unforeseen technical circumstances. Distance learning makes the student dependent on technology. At the wrong moment, the light may turn off or the computer may fail, the Internet may be cut off right during an important online seminar [5, 13].

In medical universities, distance learning technologies were previously used in various areas of acquiring and improving medical knowledge. For example, in postgraduate education to improve the qualifications of medical practitioners [14], in the form of remote trainings of medical personnel [15], for professional training and retraining of teachers of a medical university, for self-preparation of students for practical training, passing modular controls, as preparation for the licensed integrated exam "STEP" [16] or as a method of monitoring the current or final level of knowledge of students [17]. However, conducting practical classes in a medical university has a special specifics and distance education makes its own adjustments to their methodological approach [2].

The purpose of the article was the desire to share the experience of remote presentation of material in practical classes from the discipline "Human Anatomy" for domestic and foreign students at the Department of Clinical Anatomy, Anatomy and Operative Surgery Dnipro State Medical University, to identify successes and mistakes, to implement the best experience in the further practice of introducing innovative educational technologies in a medical university.

Outline of the main material. The development of innovative activities is an important area of modern world education. The main goal of innovative forms of teaching is to increase the level or quality of education, additional development of the learner and the learner. The time has come when the question of transferring training to personal computers, tablets, smartphones and other electronic devices has become a reality. Electronic technologies are, first of all, active forms of education, which are widely introduced into the learning process today.

The innovative activity of the university is the introduction of new forms and methods of educational technologies. The widespread use of electronic educational resources in the pedagogical process is an important segment for a medical university as well. In-depth study of thematic material by medical students dictates the need for the use of modern electronic technologies, which make it possible to provide full and free contact with vast volumes of reference data, monitoring changes in the content of the material in accordance with new scientific achievements of the world scale.

Today at the Dnipro Medical University, along with the academic basic form of education, various interactive options for presenting material are used, based on the use of new technical capabilities and licensed computer programs, interactive teaching methods, smart technologies, and the like. A new form of presentation of material in practical classes on "Human Anatomy" at the Department of Clinical Anatomy, Anatomy

and Operative Surgery is the use of the interactive panel SMART Boards, an interactive display that allows you to:

- 1) create a presentation by the speaker during his speech, "here and now", дает возможность демонстрировать учебный материал,
- 2) make written comments over the image on the screen,
- 3) write with a marker.

At the same time, everything written on the interactive whiteboard is transferred to students, stored on magnetic media, printed, sent by e-mail to be absent from the class.

To maximize all the properties of SMART Boards interactive whiteboards, software has been created (SMART Notebook, Bridgit, SynhronEyes).

New educational technologies for teaching material in practical classes on "Human Anatomy" is the development of content for each topic and their playback on modern Smart-TVs with universal remotes, which have access to the Internet connection and provide the opportunity to maximize the visualization of material, provide interactive media, conduct surveys and control the student's independent work.

The electronic version of the content of the practical lesson has a number of advantages over the traditional oral presentation of the material:

- 1) frees students from the need to record the material presented by the teacher by providing them with the full text of the practical lesson,
- 2) thanks to this, it creates the possibility of meaningful perception by students of the key provisions of the topic,
- 3) provides each student with the opportunity to work on the material at an individual optimal pace.

For remote practical training, the classrooms of the department are equipped with projectors, screens, laptops with the possibility of direct presentation of educational films, presentations, visual images, etc. It is the norm to conduct practical exercises using multimedia formats made in Microsoft Power Point software packages.

The test programs MyTestX Student are used to test the student's knowledge and their objective assessment. Automatic grading, the ability to adjust time limits for passing the entire test or thinking over each question, using not only questions and answers, but also illustrations of questions with pictures eliminates the teacher's subjectivity. From the selected category, a question is added to the test randomly, while both the order of the questions and the answer options can be randomly mixed, which makes it difficult to cheat and memorize. The program provides for a "teaching mode", when after each answer to an error, the student can see the correct option. The test results of students can be displayed to the teacher on a server from a computer network, and also allows you to work remotely.

Workplaces for teachers for practical classes are provided with modern technical means - PC monoblocks, system units and monitors with Web-cameras, combining the possibility of conducting classes with students in a distance learning form, providing access to information via the Internet to prepare for practical classes and lectures, to find the necessary teaching materials. Both faculty teachers and students use various

search engines in preparation for practical exercises, such as electronic reference books, electronic dictionaries, electronic libraries, etc. In the process of updating the studied discipline with a remote submission of material in a practical lesson, the following interactive technologies are used: electronic presentations, online magazines, Internet resources, websites.

Video and audio materials, multimedia technologies make it possible to more clearly reflect the content of the sections of the material being studied.

The use of electronic video presentations is an innovative step in the remote conduct of practical classes on "Human Anatomy" at the Department of Clinical Anatomy, Anatomy and Operative Surgery. This presentation of the topic can be viewed several times, focusing on important points, mastering or repeating difficult material, preparing for seminars or studying topics for self-study.

Interactive methodological support for conducting a practical lesson is provided by licensed programs of the Microsoft Office package, 3D electronic atlases (for example, Netter Interactive Atlas Of Human Anatomy, Lippincotts Illustrated Q and Neuroscience), which contain:

- 1) 3D models of macro- and microscopic anatomy,
- 2) 3D animations and training videos,
- 3) encyclopedic reference information: the name of the structures, their Latin terms and classification by anatomical groups, detailed definitions and descriptions,
- 4) the ability to choose among popular images and create your own.

This allows the student to gain not only technical knowledge, but also to develop spatial imagination, model the structure, and work out practical skills close to clinical situations.

In the organization of distance learning courses at the Dnipro Medical University and at the Department of Clinical Anatomy, Anatomy and Operative Surgery, the Moodle educational platform was used, which has various options for the formation and presentation of educational material, knowledge testing and monitoring progress. In the practice of teaching the discipline "Human Anatomy", the following types of opportunities provided by the Moodle LMS are used:

- 1) placement of curricula and discipline programs,
- 2) teaching aids, as well as links to the teaching materials of the department and materials that are freely available on the Internet;
- 3) presentations of interactive lectures;
- 4) questions, test tasks, both training and control;
- 5) current information and two-way communication between the teacher and the student.

For constant communication with students during remote practical classes, Viber, Skype communication systems are installed on the teachers' PC-workplaces. Smart messengers Telegram, WhatsApp, social networks Facebook, Facebook Messenger, Instagram are used.

Unimpeded access to the Internet and all its resources from any device is provided

using a cable and wireless network in classrooms, teachers' offices and corridors of the department by a common Internet connection network of Dnipro Medical University.

Conclusions. We agree with Goh, P. and Sandars, J. [11] is that solving the current problems of distance learning in a medical school may ultimately lead to an improvement in the learning environment in the future. The use of new interactive methods of distance education, according to our experience gained in distance practical training, will allow:

- organize distance learning activities of students of a medical university in the context of a competence-based approach to studying disciplines,
- to form and develop creative abilities, the desire for constant self-education,
- individualize the educational process by determining for each student the optimal volume and content of educational material, as well as the rate of its assimilation and the selection of teaching methods, depending on the personal characteristics of the perception of information.

Based on the experience gained, it cannot be said that distance learning at a medical university provides students with a complete mastery of practical skills, but on the other hand, it provides the teacher with tools to search for various methods of interactive learning, readiness for constant self-development.

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CHANGE IN DENTITION IN CASES OF COMPLEX EXTRACTION OF THIRD MOLARS USING STANDARD ORTHODONTIC GUARDS

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Annotation. *A study was conducted on the change in dentition in patients with complex extraction of third molars. Clinical observations were carried out in 15 patients who were diagnosed with dystopia and retention of third molars. The extractions of the third molars were carried out in a complex fashion in one visit; the patients were recommended to wear a blue orthodontic guard T4A one month before extraction and one month after extraction of the third molars. The mouth guard was worn at night for up to 6 hours.*

A comparative analysis of panoramic radiographs and diagnostic models of the jaws in the study groups before and 2 years after surgical intervention was carried out. The results of the study: significant differences in the lengths of the dentition and the occlusal relationship of the teeth of the upper and lower jaws in the studied patients before and after the complex extraction of the third molars using a T4A orthodontic guard were revealed.

Changes in the occlusal relationship of the teeth of the upper and lower jaws with the complex extraction of third molars and the use of standard orthodontic guards contributes to the physiological restructuring of the bite and functional changes in the way the dentoalveolar apparatus operates.

Keywords: *patients, complex extraction of third molars, length of dentition, standard T4A orthodontic guard.*

The functions of all elements of the motor part of the masticatory apparatus are closely related to each other. Disruption of the activity of one of the elements causes the oppression of other functions. Alteration of the occlusal relationship of the teeth of the upper and lower jaws is the main factor leading to disturbances in the work of the dentoalveolar apparatus. Changes in bite are most often the result of tooth displacement caused by the loss of contact between the antagonist teeth due to the caries process, improperly performed fillings, as well as erupting wisdom teeth – the eighth teeth [1,5,6].

The discrepancy between the size of the teeth and the alveolar arch adversely affects the entire dentition. If the total mesiodistal size of the teeth exceeds the size of the alveolar arch, compensatory mechanisms get activated, manifesting themselves in changes in the intensity of the Spee curve and incorrect inclination of the teeth [2,3,6].

The main guarantor of the functional balance of the dentoalveolar apparatus is the close contact between the teeth in the dentitions and the largely genetically determined psycho-emotional sphere of the person [2,4].

Purpose of the work: to trace changes in the dentition and the interrelations between dentitions in patients with complex extraction of dystopic and impacted third molars using standard orthodontic guards.

Research materials and methods. In 15 patients aged from 16 to 35 years, a complex extraction of the third molars was performed. The patients were divided into two groups. The first group consisted of 8 patients who underwent complex extraction of the third molars. The second group consisted of 7 patients who were recommended to wear a standard blue T4A orthodontic mouth guard for a month before surgery and continue using this mouth guard for a period of 1 month 10 days after the surgery. The mouth guard (T4A Trainer) was recommended to be used after tooth brushing in the evening and at night.

In modern dentistry, the traditional method of bite correction is the installation of braces. But in cases where this defect is insignificant, it is possible to use an alternative method – wearing a trainer. This device is a one-piece construction made of flexible, elastic and transparent silicone and polyurethane, in the form of a two-jaw mouth guard. T4A Trainer is designed to correct the occlusion, align the dentition and eliminate problems with the tone of facial and chewing muscles. The trainer has a semicircular shape that follows the outline of the dental arch.

The main elements of this type of orthodontic devices:

1. two dental canals of an arched shape for the lower and upper dentition – they play the guiding role for the teeth, allowing the patient to accurately fix the trainer on them;
2. lateral arches limiting the dental canals from the outside of the mouth guard – it is the lateral arches that cause the main therapeutic effect, due to their pressure on the teeth. For comfortable wearing, the height of the lateral arches is designed so as to only partially overlap the gingival margin at the level of the alveolar ridge;
3. the tongue restraint and the training tip, located on the inside of the T4A mouth guard, which are necessary for the formation of nasal breathing and the correct position of the tongue, respectively;
4. lip bumper and the bumpers that allow keeping the device on the teeth during the time of sleep;
5. pterygoid base for teeth with elongated distal ends; contributes to the correction of the position of the lower jaw.

We recommended using a blue model, which is made of a more elastic and softer material – silicone, which exerts little pressure on the dentition (Fig. 1).

Dispensary observation of patients was carried out for two years. At the same time, panoramic radiographs were analyzed, which made it possible to trace the dynamic changes in the dentition after the complex extraction of the third molars.

Patients were recommended the simultaneous extraction of the third molars to obtain the effect of compensatory restructuring of the bite and change in the interrelationship of the dentitions, by changing the position of the teeth in the dentition and the individual work of the muscular component of the dentoalveolar apparatus. The extractions of these teeth were performed under conduction anesthesia on both sides. The used anesthetic was Septanest 1:100,000 (Articaine family drug). The calculation of the drug dosage was carried out according to the body weight of the patients (5 mg of dry matter per 1 kg of body weight).



Fig. 1. T4A Orthodontic Trainer, blue mouth guard

In the postoperative period, the patients were prescribed the following drug treatment regimen, where the action of the components was aimed at normalizing the body's metabolic processes:

Dexamethasone, Dicynone, Ketolong, Furosemide (1 ampoule each) – were used once in the form of four intramuscular injections, immediately after the surgical intervention. For pain, Nimesil was used (1 powder dose was dissolved in 100 ml of water and drunk 1 time a day, during 5 days, after having a meal).

To prevent the development of the inflammatory process and pathological changes associated with it, Suprastin and mefenamic acid were used (1 tablet each x 2 times a day, during 5 days, after meals, accompanied by drinking plenty of water).

Suprastin has an antipruritic, antiedemic, sedative and hypnotic effect; it relieves spasms of smooth muscles, reduces capillary permeability, and prevents the development of anaphylactic shock and allergic reactions.

Mefenamic acid has anti-inflammatory, antipyretic and analgesic properties. The mechanism of anti-inflammatory action is due to the ability to inhibit the synthesis of inflammatory mediators (prostaglandins, serotonin, kinins, etc.), to reduce the activity of lysosomal enzymes that are involved in the inflammatory reaction. Mefenamic acid – stimulates the formation of interferon.

In order to normalize the body hemodynamics, the following drug was prescribed: Cyclo-3-Fort (1 capsule 2 times a day for 10 days). Pharmacotherapeutic group: venotonic agent of plant origin. The drug increases the venous tone, which is associated with a direct stimulating effect on the postsynaptic α -adrenergic receptors of the smooth muscle cells of the vascular wall, and also affects the activity of noradrenalin released from the storage granules in the presynaptic nerve endings. In addition to this, the drug has a lymphatic effect, improves lymphatic outflow from peripheral tissues, which is

very important after surgical interventions. Cyclo-3-Fort reduces capillary permeability and increases capillary resistance.

2 days after surgical intervention, the patients were prescribed Ciprolet A – active ingredients: ciprofloxacin, tinidazole; 1 coated tablet contains ciprofloxacin hydrochloride, equivalent to 500 mg of ciprofloxacin, tinidazole – 600 mg. The mechanism of action of ciprofloxacin is due to the inhibition of the DNA gyrase enzyme of bacteria. The result of such suppression is a derangement of the bulk structure of bacterial DNA, which makes further division of bacterial cells impossible. The main indications for antibiotic therapy: Local infection with the risk of spreading to surrounding tissues (acute purulent periodontitis, pericoronitis, periostitis); Exacerbation of chronic generalized periodontitis and other chronic diseases of the maxillofacial region; Purulent inflammatory diseases of soft tissues (lymphadenitis, abscess, phlegmon); Inflammatory process of bone tissue (osteitis, osteomyelitis). Drug administration schedule: 500 mg (1 tablet) 2 times a day 1 hour before or 2 hours after meals, during 5 days.

In order to restore the microflora, Linex was prescribed (1 capsule 2 times a day for four days); this drug is based on lyophilized live lactic acid cultures of bacteria; the action of this drug is aimed at restoring normal intestinal microflora, disturbed, in particular, by the action of an antibiotic.

Heparin ointment was applied externally, lubricating the skin in the area of edemas and swelling 2 times a day for 10 days. Heparin ointment is a direct anticoagulant; it causes anti-inflammatory and local analgesic effect, prevents the formation of blood clots and promotes the resorption of edemas and hematomas.

Rinsing of oral cavity was carried out with “Forteza”; the active ingredient of the drug is Benzylamine, which has analgesic and antiexudative properties. When applied topically, Benzylamine acts as a disinfectant. Its effectiveness in topical applications is due to the ability to penetrate the epithelial layer and achieve effective concentrations within inflamed tissues. When applied topically, Benzylamine is absorbed by the mucous membrane; however its concentration in the blood plasma is so low that it cannot have any pharmacological effect. Benzylamine is excreted from the body mainly through the urine in the form of inactive metabolites or conjugation products. This drug is used only for rinsing the oral cavity.

One cap (15 ml) of rinsing solution was recommended. After rinsing, the solution was spat out; the procedure was repeated 3-4 times a day for 7 days.

The total recovery period of the patient's body after surgical intervention was 1.5 months.

The panoramic radiographs were analyzed using the Planmeca Romexis application of the Planmeca ProMax unit, which allows measuring the length of the dentition. The lengths of the dentitions were measured before and 2 years after the complex extraction of the third molars. To do so, the length of the dentition was calculated based on the maximum protruding point of the distal surface of the coronal part of the seventh teeth on both sides of the upper and lower jaws

Results and their discussion. The measurements of the dentitions using Planmeca

Romexis application allowed us to obtain the following results: in the first group, the length of the dentition before the extraction of the third molars was 81.1 ± 0.32 mm in the upper jaw, 74.2 ± 0.77 mm in the lower jaw; in the second group, the same value for the upper jaw was 81.7 ± 0.32 mm, and for the lower jaw – 77.5 ± 0.64 mm; The ratio of the length of the upper dentition to the length of the lower dentition in the first group was 1.093, and in the second group – 1.054; this indicated that in the first group of patients, the load on the dentition was distributed less evenly. The ratio of the lengths of the upper and lower dentition should tend to unity.

After the complex extraction of the third molars, the measurement was carried out two years later, and the following results were obtained: in the first group, the length of the upper dentition was 86.7 ± 0.39 mm, and the length of the lower dentition was 79.5 ± 0.57 mm. In the second group, where a T4A orthodontic guard was used after complex extraction of the third molars, the length of the upper dentition was 89.1 ± 0.98 mm, and the length of the lower dentition was 84.4 ± 0.69 mm. The ratio of the length of the upper dentition to the length of the lower dentition after complex extraction of the third molars in the first group was 1.091, and in the second group it was 1.056.

When comparing the values of the ratios of the length of the upper dentition to the length of the lower dentition before and after complex extraction of the third molars, no significant differences were found.

In order to clarify the changes in the length of the dentition of the upper and lower jaws in the study groups before and after the complex extraction of the third molars, we summarized the length values of the upper and lower jaws, and after that we found the difference between them. The total length of the dentition of the upper and lower jaws in the first group before and after the complex extraction of the eighth teeth was 155.3 mm and 166.2 mm, respectively. The total length of the dentition of the upper and lower jaws in the second group before and after the complex extraction of the third molars was 159.2 mm and 173.5 mm, respectively. See Table.

Table 1

**Indicators of the lengths of dentitions of the upper and lower jaws
in the study groups**

groups	Number of patients (n)	Length of dentition (mm)			
		Before tooth extraction		After complex tooth extraction	
		Upper jaw	Lower jaw	Upper jaw	Lower jaw
first	8	$81,1 \pm 0,32$	$74,2 \pm 0,77$	$86,7 \pm 0,39$	$79,5 \pm 0,57$
second	7	$81,7 \pm 0,32$	$77,5 \pm 0,64$	$89,1 \pm 0,98$	$84,4 \pm 0,69$

The difference in the total length of the dentition of the upper and lower jaws before and after the complex extraction of the third molars was 10.9 mm in the first group, and 14.3 mm in the second group. Significant differences in the values of the difference in the total length of dentition of the upper and lower jaws before and after the complex extraction of the eighth teeth ($P < 0.05$) were obtained. The use of a blue T4A orthodontic

guard contributed to a more intensive restructuring of the bite, as evidenced by the indicators of the difference in the total length of dentition of the upper and lower jaws in the groups before and after the complex extraction of the third molars. Figure 2.

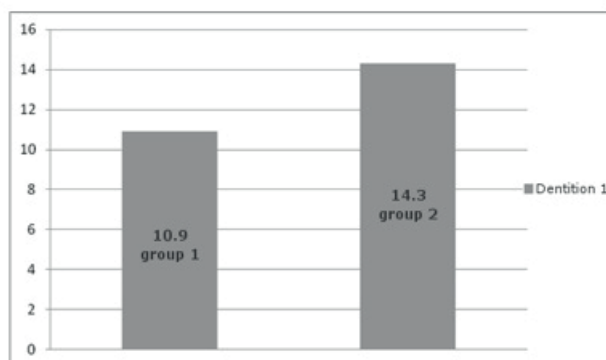


Fig. 2. The difference in the total length of the dentition of the upper and lower jaws in the groups before and after the complex extraction of the third molars.

For two years, patients of both groups were registered at the dispensary.

The complex extraction of the third molars contributes to the restructuring in the dentoalveolar apparatus, in particular, an increase in the total length of the dentition of the upper and lower jaws occurs, and this leads to a change in the occlusal relationship of the teeth of the upper and lower jaws, which in turn reduces the load in the structures of the temporomandibular joint as well as the load on the chewing muscles.

Changes in the occlusal relationship of the teeth of the upper and lower jaws after complex extraction of the third molars contributes to the uniform distribution of the chewing pressure due to physiological restructuring of the bite.

Conclusions. Significant differences ($P < 0.05$) in the total length of the dentition of the upper and lower jaws in patients before and after complex extraction of the third molars were obtained.

1. The difference in the total length of the dentition of the upper and lower jaws before and after the complex extraction of the eighth teeth was 10.9 mm in the first group, and 14.3 mm in the second group, where the blue T4A orthodontic guard was additionally used.

2. The complex extraction of third molars contributes to a change in the occlusal relationship of the dentitions, as well as a uniform distribution of the chewing pressure and a decrease in the load on the structures of the dentoalveolar apparatus due to physiological restructuring of the bite.

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INFLUENCE OF CADMIUM SALTS ON THE DEVELOPMENT OF THE SKELETAL SYSTEM AND IN THE CORRECTION WITH SUCCINATES OF METALS (LITERATURE REVIEW)

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Annotation. *Environmental contamination is becoming an increasingly serious problem for humanity every year. One of the most dangerous, long-acting and stable pollutants are heavy metals, the most common man-made associations of which are represented by salts of mercury, cadmium and lead.*

Keywords: *osteotoxicity, environmental contamination, succinates, oxidative stress, cadmium.*

Relationship of the publication with planned research works. The work was performed at the Department of Clinical Anatomy, Anatomy and Operative Surgery of DSMU within the research "Morphofunctional state of organs and tissues under the influence of external and internal factors", № state registration 0120U105219, deadline 2020-2023.

Environmental protection in the interests of public health, in particular, reducing the risk of adverse effects of pollution of various natural objects on humans, is a fundamental task of state environmental policy [1]. Prevention of environmental degradation and danger to the population due to anthropogenic or natural factors is currently considered the basis of environmental security of the state, which is an important component of national security [2].

Contamination of the environment, which is becoming an increasingly serious problem for mankind every year, does not contribute to the harmonious relationship between the world's population and the natural environment. [1, 2]. According to the Lancet Commission of the Global Alliance on Health and Pollution (Global Alliance for Health and Pollution, GAHP), Ukraine is included in the anti-rating of European countries by the number of fatalities related to environmental pollution. This factor is considered by scientists to be the cause of the annual death of more than 57,000 Ukrainians – this is the fourth indicator in Europe. The same "honorable" fourth place Ukraine ranks in the number of deaths per 100 thousand population - 128 cases [3].

One of the most dangerous, long-acting and stable pollutants are heavy metals, the most common man-made associations of which are salts of mercury, cadmium and

lead, which when entering the body of mammals stimulate oxidative stress and compete with biogenic metals (zinc, copper, calcium, etc.) binding to the active center of many proteins and enzymes, causing disruption of their functions [5].

Cadmium (Cd) is a natural element with a relatively low content in the earth's crust (0.1-0.5 parts per million). In the free state in the environment does not occur, but is present mainly in the form of free hydrate ions and complex compounds with inorganic (chloride, carbonate, sulfide and hydroxide complexes) and organic ligands (amino, fulvic and nucleic acids) [5, 6].

Cadmium contamination of the environment (air, water and soil) is carried out from natural or man-made (anthropogenic) sources. According to Z. Rahman et al. (2019) and G. Genchi et al. (2020), the share of anthropogenic sources in environmental pollution is 3-10 times greater than natural, and ranges from 54% to 95% [5, 6].

Cadmium and its compounds enter the body mainly through the respiratory tract (10-40%), as well as the diet: the average "consumption" of the element with food, typically ranges from 8 to 25 mcg per day, of which approximately 0.5-1.0 mcg is actually stored in the body. "Inorganic" cadmium accumulates primarily in the liver, to a lesser extent - in the male genitals. The main part of the total cadmium in the form of a thiol complex is still absorbed by the kidneys: a violation of their functioning occurs when the concentration of the toxicant in the cortical layer of the body is about 200 mg / kg. The biological half-life of cadmium ranges from 40 days in the blood to 20 years or more - in the kidneys and liver. The FAO / WHO provisionally acceptable limit for "safe" cadmium intake is 7 µg / week / kg body weight or 25 µg / kg body weight per month, and the maximum dose is 60-70 µg per day [6, 7].

A set of studies conducted in the first twenty years of the XXI century showed that one of the important "targets" of the negative effects of cadmium is cartilage: prolonged exposure to the toxicant leads to increased fragility of the skeleton and reduced bone mineral density [8].

The key role in understanding the processes of regulation of bone reconstruction belongs to the cytokine system of the receptor activator of nuclear factor kappa-β (Receptor Activator of Nuclear factor kappa-B, RANK), its ligand (Receptor Activator of Nuclear factor kappa-B Ligand, RANKL) and osteoprotegerin (OPG), responsible for osteoclastogenesis, resorption and remodeling of bone tissue. Regulation of bone remodeling occurs under the influence of systemic and local factors with hormonal activity. PTH, calcitriol, somatotrophic hormone, insulin, thyroid and sex hormones affect bone remodeling by maintaining a constant metabolism of calcium, phosphorus, magnesium from bone to extracellular fluid and vice versa. Local factors (insulin-like growth factor, osteoclast-activating factor, platelet-derived growth factor, fibroblast growth factor, prostaglandin E2) are mediators of the response to mechanical stress and changes in systemic hormone levels. Imbalance between the processes of bone remodeling is a central link in the pathogenesis of osteoporosis, including cadmium induced [8-9].

In this aspect, the "indicative" victims of cadmium are patients with endemic disease itai-itai ("it hurts – it hurts disease"), which was first discovered in the Jinzu River

Basin in Toyama Prefecture (Japan) in the 1920s [9]. The level of urinary excretion of cadmium in itai-itai patients ranged from 10-30 $\mu\text{g} / \text{g}$ creatinine, and the results of radiological examinations of their bones showed the presence of Looser zones - areas with abnormal radiolucency, which crossed one or both cortical edges of the bone and was an obvious indicator of osteoporosis [9].

In 2000 M. Kasuya substantiated the mechanism of osteomalacia in patients with itai-itai, explaining it by the development of Cd-induced renal tubular insufficiency, which led to increased bone resorption and, finally, to bone damage [10]. However, this mechanism of osteoporosis in patients with itai-itai did not explain all the phenomena observed in other people who were exposed to cadmium. Thus, R. Honda et al. (2003) found reduced bone mineral density in Japanese women without signs of renal impairment [11], which demonstrated the complexity of the mechanisms of Cd-induced osteotoxicity.

Currently, two mechanisms of cadmium effect on bone tissue are assumed - direct and indirect. The direct mechanism involves the direct effect of the toxicant, which causes dysfunction of bone cells and causes increased bone resorption and weakening of its calcification. The indirect mechanism is mediated by the development of Cd-induced renal failure, associated with increased renal excretion of calcium and phosphorus, inhibition of the production of active metabolites of vitamin D, and impaired absorption of calcium in the digestive tract [12].

It is now believed that the main cause of bone damage in chronic cadmium intoxication is renal dysfunction. At the same time deterioration of a condition of microarchitectonics of bone tissue with the subsequent strengthening of fragility of bones and risks of fractures increases in proportion to degree of defeat of the tubular device of kidneys. Dysfunction of the enzymatic system that metabolizes vitamin D causes a decrease in the production of its active metabolite – $1\alpha, 25\text{-dihydrooxycalciferol}$ ($1\alpha, 25\text{ (OH) } 2\text{D}$) in the proximal tubules. A number of studies of $1\alpha, 25\text{ (OH) } 2\text{D}$ and parathyroid hormone (PTH) in residents with Cd-induced renal impairment showed that decreased levels of this active metabolite were closely correlated with increased PTH and $\beta 2\text{-microglobulin}$. Once the accumulation of cadmium in the kidneys reaches the critical level required to induce proximal tubular dysfunction, the content of the active metabolite of vitamin D in the serum decreases significantly, and calcium loss - on the contrary, increases. Decreased serum production of $1,25\text{-dihydrooxycalciferol}$ causes impaired reabsorption of calcium from the gastrointestinal tract, which in turn increases the secretion of PTH, which activates osteoclasts to "resorb" bones and release calcium into the systemic circulation and osteoporosis [12].

The direct effect of cadmium on bone metabolism has been demonstrated by studies of levels of biomarkers of bone remodeling. Thus, abnormal bone synthesis was accompanied by an increase in the concentration of osteocalcin in the serum and alkaline phosphatase in the bones. Acceleration of bone resorption, which did not depend on renal dysfunction and was manifested by an increase in deoxypyridoline, as well as N- and C-terminal telopeptide of type I collagen (NTx and CTx), was found even in people

with low cadmium levels [2, 11].

In vivo studies in experimental animals have shown that chronic exposure to cadmium reduces the mineralization of vertebral bodies, changing their biomechanical properties and making them more susceptible to deformation and destruction. [29]. The results of studies by J. Rodríguez et al. (2016) and D. García-Mendoza et al. (2019) provided evidence that chronic exposure to cadmium reduces bone volume and increases the activity of Tartrate-Resistant Acid Phosphatase (TRAP) in the subchondral layer of the tibia [8, 14], indicating the induction of osteopenia by increased bone resorption. There was an increase in the percentage of adipose bone marrow, which indicated cadmium deprivation of differentiation of mesenchymal cells to osteoblasts by stimulating adipogenesis [14].

In vitro studies have shown that cadmium increases RANKL expression, TRAP activity and TRAP-positive cell formation in the presence of RANKL, and stimulates osteoclast formation in osteoblast and osteoclast progenitor subculture. In addition, cadmium has been shown to induce osteoblast apoptosis by disrupting their cytoskeleton, as well as causing DNA fragmentation, an increase in the number of micronuclei and nuclear bridges, and an increase in reactive oxygen species [10, 12].

Another potential "target" of the negative effects of cadmium on the musculoskeletal system is articular cartilage. An adequate cell model for studying the mechanisms of Cd-induced toxicity was provided by the culture of primary chondrocytes in vitro, obtained by stepwise digestion with trypsin and collagenase IV cartilage of the knee joint of 15-day-old chicken embryos. The study showed that cadmium inhibited the expression of COL2A1 macromolecules and acid mucopolysaccharides in the extracellular cartilage matrix and promoted the expression of MMP-9 protein [15].

Due to the fact that the leading mechanism underlying Cd-induced cytotoxicity is oxidative stress [6, 15, 16], it can be assumed that restoring the balance of activity of pro- and antioxidant systems, inhibition of excessive generation of reactive oxygen species (ROS), weakening of lipid peroxidation processes against the background of increasing the energy potential of the cell will potentially contribute to leveling or significantly weakening.

Traditionally, the main sources of ROS in mitochondria were considered to be the respiratory complex I (NADH: ubiquinone oxidoreductase, CI) and complex III (ubiquinol: cytochrome oxidoreductase c, CIII), while the contribution of complex II (succinate dehydrogenase, LDH, CII) in this process was practically not taken into account [17]. However, it soon became known that mitochondrial complex II is indeed able to generate high concentrations of reactive oxygen species under conditions of low levels of succinate when the flow of electrons to the respiratory chain is blocked. [18]. It was shown that the main site of production of reactive oxygen species in the respiratory complex II is FAD, covalently linked to the subunit A of succinate dehydrogenase, provided that the binding site of dicarboxylate is free. Fully reduced FAD can transfer either one electron to oxygen, causing the formation of superoxide under aerobic conditions (which is characteristic of succinate: ubiquinone oxidoreductase), or two

electrons, generating H₂O₂ (which is typical of fumarate: ubiquinone reductase, which functions in the environment) [19].

In 2015, K. Kluckova and a team demonstrated that the ability of the succinate dehydrogenase complex to generate ROS links it with the process of cellular apoptosis. Thus, studies of complex II integrity have shown that induction of cell apoptosis is associated with specific enzyme degradation, resulting in SDGA and SDHV subunits being released from the membrane domain into the mitochondrial matrix, then remaining enzymatically active and can effectively remove electrons from succinate. Due to the absence of electron acceptors as a result of separation from SDGS and SDGD, the flow of electrons is blocked, they are transferred to molecular oxygen, generating excessive amounts of ROS, which induce cellular apoptosis [20].

The results of studies of the 70-80s of the last century showed that succinates have an inhibitory effect on lipid peroxidation in mitochondria / mitoplasts / submethochondrial particles formed by NADPH / ADP / Fe³⁺ + complexes or organic hydroperoxide. These prooxidants significantly stimulated the formation of malonic dialdehyde (the final product of LPO), and lipid peroxidation of membranes dissipated mitochondrial membrane potential due to the appearance of physical "holes" in the lipid bilayer. In a study by P. Sharmila et al. (2017) showed the accumulation of proline in mitochondria and a decrease in the ability of mitochondria to oxidize nicotinamide-adenine-dinucleotide by 35% under the action of cadmium. The protective role of succinate as a mitochondrial respiratory substrate was mainly due to a decrease in the CoQ pool. NAD⁺-dependent substrates were less effective in inhibiting lipid peroxidation because strong peroxide stimuli permeate the membranes, releasing NAD⁺. Therefore, with decreasing coenzyme concentration, the oxidation of substrates slowed down and the formation of the antioxidant CoQH₂ decreased. However, succinate was oxidized by membrane-bound succinate dehydrogenase, and the activity of the enzyme was only moderately sensitive to oxidants. Therefore, succinate was more effective in maintaining the pool of CoQH₂, thus ensuring the integrity of cell membranes [21].

So:

- succinates have an inhibitory effect on lipid peroxidation in mitochondria / mitoplasts / submethochondrial particles formed by NADPH / ADP / Fe³⁺ + complexes or organic hydroperoxides [17,];
- the protective role of succinates as a mitochondrial respiratory substrate is mainly due to the support of the CoQH₂ pool, which ensures the integrity of cell membranes [5, 16];
- succinates inhibit FAD-induced electron transfer to oxygen in mitochondrial respiratory complex II, which significantly reduces the production of superoxide and H₂O₂ [10];
- succinates inhibit the generation of reactive oxygen species, disrupting the transfer of electrons through complex II to the pool of ubiquinones [15].

Currently, the use of succinates (preparations based on succinic acid) is one of the priorities of modern fundamental and practical medicine. Drugs containing succinic acid

(metal succinates, mexidol, reamberin, etc.) are drugs of metabotropic type of action, the pharmacotherapeutic effects of which are aimed at restoring biochemical metabolic reactions disrupted by pathological processes. Succinic acid is an intracellular metabolite that is involved in metabolic processes in the body and acts as a substrate for oxidative phosphorylation in the mitochondrial cycle of tricarboxylic acids, performing a catalytic function, reduces the concentration of lactate, pyruvate and citrate, the level of which increases energy. required for normal cell function. This intermediate refers to low-toxic compounds and has no mutagenic or teratogenic effects [22].

Conclusions. Succinates, by restoring the balance of activity of pro- and antioxidant systems, inhibiting the excessive generation of reactive oxygen species and weakening the processes of lipid peroxidation, can potentially eliminate or significantly reduce the manifestations of Cd-induced toxicity, the leading mechanism of which is considered to be oxidation.

Prospects for further research. Given the above, experimental study of morphological Cd-induced pathological changes in rat bones and evaluation of the possibility of correction of cadmium-associated osteotoxicity by using succinic acid preparations, in particular, iron and zinc succinates as potential biological antagonists of cadmium, is urgent and urgent.

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CLINICAL ASPECTS OF THE EFFECTS OF CADMIUM AND

LEAD COMPOUNDS IN THE LIVER (LITERATURE REVIEW)

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Annotation. *The important scientific problem of modern science is the issue of abilities and mechanisms of regulating the public health by influencing the environment, which contamination has become a global, stable and permanent factor, regardless today's development of science and technology. Some heavy metals, particularly lead and cadmium, are considered to be the main pollutants. They are mentioned in the «List of Controlled Toxic Substances» of the United States Environmental Protection Agency (US EPA). One of the main "targets" of Pb/Cd-induced toxicity is liver tissue. The use of biometals (zinc, iron, magnesium) prevents, reduces or completely eliminates the Pb/Cd-induced specific and nonspecific effects on the organ, cellular and molecular levels.*

Keywords: *biometals, cadmium, lead, metallothioneins, hepatotoxicity, environment.*

Formulation of the problem. In recent years, the problems of strategic and tactical approaches to improving the health of the population of different countries, including Ukraine, have become increasingly important. One of the most important scientific problems of our time is the question of the possibility and mechanisms of regulating the level of health of the population by influencing the quality of the living environment.

According to the United States Environmental Protection Agency (US EPA) and the European Chemical Agency (ECHA), the priority pollutants listed in the "List of Controlled Toxic Substances" are heavy metals [1].

The greatest health risks are heavy metals and their compounds, which are extremely dangerous and dangerous chemicals (hazard classes 1 and 2), in particular, lead (Pb) and cadmium (Cd) [2]. These toxicants are characterized by a high prevalence in the environment and the ability to harm the body with prolonged use, even in concentrations not exceeding existing hygienic standards. The danger of lead and cadmium is determined by the polytropism of their negative impact: accumulating in the body, they have the ability to interfere with metabolic cycles, quickly change its chemical form when moving from one environment to another, not subject to biochemical decomposition, enter into numerous chemical reactions with each other and with other chemical compounds, can cause a deficiency of essential elements, displacing them from the connection with

protein components [3]. This can lead to polysystemic involvement in the pathological process of vital organs and systems with the formation of functional and organic damage at the organ, cellular and molecular levels.

The purpose of the article. Analyze and evaluate pathophysiological, histological and histochemical changes in the liver, induced by toxic effects of lead and cadmium compounds, and identify promising ways to correct and prevent them based on available literature.

Analysis of recent research and publications. Direct hepatotoxic effects, which are inherent in lead, are realized by the direct action of xenobiotics on the processes of lipid peroxidation in liver tissue [4, 5]. Under conditions of chronic lead intoxication is the activation of lipid peroxidation processes with a simultaneous decrease in the activity of antioxidant enzymes, which leads to increased DNA fragmentation. Such deviations are also accompanied by changes in blood biochemical parameters (increased concentration of total bilirubin, alanine aminotransferase, γ -glutamyltranspeptidase and alkaline phosphatase) [6].

Lead-mediated hepatic hypercholesterolemia is associated with enzyme activation, involved in the synthesis of cholesterol (3-hydroxy-3-methylglutaryl-CoA reductase, farnesyl diphosphate synthase, squalene synthase), with a simultaneous decrease in the activity of enzymes (7- α -hydroxylase), which have a catabolic effect on cholesterol [7].

In the experimental work of A.A. Berrahal et al. it was demonstrated that the severity of functional and morphological changes in the liver in chronic lead intoxication depends on age. It was shown that in young animals exposed to the toxicant, a significant increase in the concentration of alanine aminotransferase and alkaline phosphatase was observed in the blood plasma, which was accompanied by a simultaneous decrease in albumin levels compared with the older group of animals [8].

The hepatotoxic effect of lead is confirmed by the formation of histological and histochemical pathological changes in the liver tissue. According to the results of studies by B.M. Jarrar et al., under conditions of chronic Pb-induced intoxication in hepatocytes revealed a significant nuclear polymorphism, moreover, some changes in Pb-associated pleomorphism resemble those usually observed in liver dysplasia and its carcinomatous lesions. Apoptotic changes of hepatocytes are accompanied by edema of organelles, especially mitochondria, endoplasmic reticulum and rupture of lysosomes with leakage of lysosomal hydrolytic enzymes, causing hydropic cytoplasmic degeneration as an initial sign of liver cell necrosis [9, 10].

Chronic lead intoxication causes Kupffer cell hyperplasia, which usually correlates with the level of hepatocyte damage caused by the toxicant, and is considered by some authors to be a consequence of increased autophagy in liver tissue, which helps to eliminate the accumulated lead and is a protective mechanism of detoxification [9, 11]. A team of researchers led by A. Hegazy demonstrated that in animals that received for 8 weeks a 0.13% aqueous solution of lead acetate, there were changes in hepatocytes in the form of abundant lymphocytic infiltration, enhanced cell polymorphism, pyknotic nuclei

and areas of cell necrosis with overt moderate periportal fibrosis and severe vacuolar degeneration, which is associated with significant depletion of glycogen content. Ultrastructural examination revealed mitochondrial edema, appearance of interstitial inflammatory cells and scattered lead electron-dense inclusion bodies. Scientists believe that such Pb-induced pathomorphological changes in organ tissue can subsequently be naturally transformed into liver cirrhosis [12].

Lead has been reported to cause depletion of glycogen in hepatocytes, which may be due to the toxicant's effect on glucose absorption or on the activity of enzymes involved in glycogenesis and / or glycolysis [9, 12]. Chronic lead intoxication causes an increase in alkaline phosphatase activity, primarily in the canalicular membranes of hepatocytes [6, 8, 9, 12]. According to D.S. Aksu et al., Such an increase in alkaline phosphatase activity may indicate the need to transfer lead ions across cell membranes, where the enzyme is involved in the absorption and transmembrane transport of electrolytes [13].

The development of cadmium-induced hepatocellular trauma has many features in common with the formation of Pb-associated hepatotoxicity. The negative effect of cadmium on the hepatobiliary system is also mediated primarily by the formation of bonds with SH groups of molecules of mitochondrial protein structures and the development of oxidative stress, which causes depletion of cellular GSH content. In addition, cadmium competes with essential metals (zinc Zn, selenium Se, copper Cu and calcium Ca) [14], displacing them from metal-containing complexes, causing metabolic disorders, inhibition of energy generation by mitochondria and reducing the energy potential of cells, affects DNA repair systems and redox state, alters intercellular adhesion, inducing dissociation of the E-cadherin / β -catenin complex [15, 16].

The negative effect of cadmium on the hepatobiliary complex is closely related to the development of inflammatory foci in the liver, accompanied by infiltration of the organ by polymorphonuclear neutrophils, which, along with Kupffer cells, release pro-inflammatory substances and cause the development of necrosis. Studies by T. Yamano et al., conducted in the early XXI century, show that activated Kupffer cells, releasing a number of inflammatory mediators, subsequently increase the expression of adhesion molecules, which initiate a cascade of cellular and humoral responses leading to inflammation and secondary Cd-induced liver damage [15, 17].

The functioning of signaling systems for the expression of genes of pro-inflammatory and adhesion molecules provide active forms of oxygen, enhancing the activity of nuclear factor κ B (NF- κ B) and activator protein-1 (AP-1). In response to the increase in the level of pro-inflammatory factors in the liver, the production of glycoprotein of the acute phase of inflammation - C-reactive protein, the content of which shows a clear positive correlation with the level of serum cadmium accumulation [15, 18, 19].

As demonstrated by in vitro studies on rat, mouse and human hepatocytes, apoptosis plays an important role in cadmium hepatotoxicity, primarily due to the interaction of the toxicant with thiol groups in mitochondria. In a study on isolated liver mitochondria in mice, cadmium was shown to directly inhibit adenosine diphosphate-induced respiration, increases the ionic permeability of mitochondrial membranes, reduces their

transmembrane potential, causes the release of cytochrome C and induces the activation of caspases [20, 21].

In liver cells, cadmium causes the activation of caspase-9 and caspase-3, probably due to the release of cytochrome C from damaged mitochondria. Caspase-independent apoptosis may occur due to Cd-mediated effects on the tumor suppressor protein of p53, because Cd^{++} can replace Zn^{++} in the p53 structure, thereby compromising the recovery of p53-induced DNA damage or cell cycle arrest. Cadmium can also activate Ca^{++} -a dependent protease of calpain, which plays an important role in the development of early stages of Cd-induced caspase-independent apoptosis in hepatocytes [22, 23].

The main morphological manifestation of Cd-associated hepatocellular trauma is considered to be an increase in the hepatosomatic index and the formation of structural pathological changes in the liver tissue. Chronic cadmium intoxication causes general hydropic and local balloon dystrophy of hepatocytes, development of monocellular foci of necrobiosis and necrosis of liver cells with reactive moderate infiltration by lymphocytes and macrophages, phenomena of periportal fibrosis and vacuolar degeneration, uneven expansion of the lumen of sinusoids and a significant increase in their bulk density. Electron microscopic examination reveals changes in the shape and swelling of mitochondria, as well as signs of their biodegradation, reducing the bulk density of the profiles of the granular cytoplasmic network, which was accompanied by their degranulation, focal vacuolization, as well as the presence of small diffuse lipid inclusions in the cytoplasm [24, 25].

Since chronic intoxication with heavy metal compounds, in particular lead and cadmium, leads to the formation of pronounced functional and morphological changes in the liver, it is important to find effective means of prevention and elimination of their hepatotoxic effects.

Currently, one of the priority areas of medical science is the search for and use of biometals - biological antagonists of cadmium and lead, which would reduce the negative impact of these toxicants at the organ, cellular and molecular levels. Currently, the most studied biometals, which have antagonistic properties against cadmium and lead, are selenium, magnesium, iron and zinc [26].

Zinc is an important trace element that plays a key role in counteracting the toxic effects of heavy metals. Experimental work in mice, fish and hamsters proved the role of copper-zinc superoxide dismutase 1 (SOD1) and glutathione-associated enzymes in Zn-mediated protection against Cd-induced cytotoxicity. SOD1 has been shown to protect cells from apoptosis by inhibiting caspase-9 activation and mitochondrial cytochrome C release, as well as by reducing chronic endoplasmic reticulum stress and glutathione by preventing cadmium intake by reducing its ZIP8 expression also helps protect against oxidative stress caused by heavy metals, including lead and cadmium [27].

A potential mechanism of Zn-mediated protection against Cd-induced cytotoxicity is competition for the system of ion transporters. In addition, G. Jacquillet et al. cadmium has been shown to induce apoptosis by activating caspase 3 in the cortical layer of the kidney, and zinc prevents apoptosis and necrosis by inhibiting it [28].

Zinc and iron (Fe), which are major scavengers of free radicals, play an important role in maintaining prooxidant and antioxidant status. The results obtained by J. Obaiah et al. indicate that Zn and Fe or their combinations reduced cadmium-induced oxidative stress in the liver and kidneys of rats. The use of zinc and iron both alone and in combination inhibited the formation of malonic dialdehyde in the liver and kidneys of experimental animals. The maximum decrease in malonic dialdehyde content was observed in the liver tissue of Cd-associated rats, in which zinc and iron were added to the diet for 15 and 30 days [29]. Based on the available literature publications, it has been suggested that Zn and Fe maintain the bioavailability of essential trace elements, thereby playing a role in the displacement of cadmium from metal-containing sites of enzyme binding. Zn and Fe have also been reported to protect against Cd-induced changes in both renal and hepatic tissue by direct or indirect induction of metallothioneins (MT), blocking the oxidative chain reaction and inhibiting the formation of lipid peroxidation products [30]. The increase in the level of metallothioneins in both studied tissues was probably due to the differential expression of the MT gene. The combined addition of Zn and Fe to the diet was more effective in the synthesis of metallothioneins and attenuation of Cd-induced cytotoxicity than the individual use of these trace elements [29].

Conclusions. Chronic lead and cadmium intoxication causes polysystemic involvement of vital organs and systems in the development of pathological processes at the organ, cellular and molecular levels.

The use of biometals - biological antagonists of cadmium and lead helps to prevent, attenuate or eliminate Pb / Cd-induced adverse specific and non-specific effects due to direct and indirect induction of metallothioneins, activation of the antioxidant defense system and reduction of the generation of reactive oxygen species.

Prospects for further research. Given the above, the analysis and evaluation of morphological changes in rat liver in the isolated exposure of lead acetate and its combinations with iron and zinc succinates is an urgent task of modern experimental medicine.

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HISTORY

PROTESTANT CONFESSIONS IN THE CONDITIONS OF THE ANTI-RELIGIOUS POLICY OF BOLSHEVISM OF THE 1920s

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Annotation. *The policy of the Soviet state on the Protestant religious communities in Podolia in the 1920s is considered in the article. During this period, a significant number of Protestant organizations operated in the USSR, some of them were active in the Podolsk region, including evangelical Christians, Baptists, Adventists, Pentecostals, and a growing number of followers of the Protestant faith.*

Representatives of the Soviet authorities classified these organizations as "sectarianism" and tried to use them in the implementation of their own ideological and social policies. This paper analyzes the number and features of the functioning of Protestant communities, their place and role in the general structure of religious life in the region and on a national scale, determines the attitude of Protestant denominations to the Russian Orthodox Church.

Keywords: *Protestantism, Evangelical Christians, Baptists, Seventh-day Adventists, sectarianism, denominations, religious communities, religious movement, anti-religious policy.*

Problem statement. In recent decades, Protestant organizations in our country have become noticeably stronger and have taken an important place in the religious life of society. The modern confessional palette of Ukraine is quite diverse. The relations between Protestants and traditional denominations, such as Orthodox, Roman Catholics, Greek Catholics, are marked by complexity and drama. There is state interference in the affairs of certain denominations, there is a marked desire of certain political forces to use the issue of faith in their interests. Protestant movements of Baptists, Evangelicals, Adventists, Pentecostals in Ukraine have a long history of formation. An important period in the history of Protestantism in Ukraine is the 1920s when the organizational and ideological design of this area continued, communities were created, preaching and publishing activities were carried out, and religious principles were defended.

Analysis of sources and recent research. State-church relations in the USSR during the 1920s were covered in the domestic works of scientists, in particular A. Zinchenko [6], O. Ignatushi [8], A. Kiridon [9], L. Babenko [1], G. Lavryk. [10], O. Galamai [3]. After exploring various aspects of religious life, they also touched on the activities of Protestant organizations. Y. Zinko [7] drew attention to the confrontation between the government and Protestantism in Soviet times, pointing to the role of the latter in the social and spiritual life of Ukraine. The so-called sectarian movement of the 1920s was

studied by V. Pashchenko [12], S. Zhiliuk [5], N. Rubleva [13], V. Bernatsky [2], Y. Novak-Golubeva [11], T. Hrusheva, R. Sitarchuk [14] and others.

Y. Novak-Golubeva found out the main reasons for the increase in the number of sectarian communities in the 1920s and their relationship with the Synodal (Renewal) Church. N. Rubleva paid attention to the study of the repressive activities of the Soviet government against the "clergy" and "sectarians" in 1917 - 1939. The researcher claims that the Soviet punitive authorities supervised Protestant organizations during the 1920s, and since 1929 began to apply rigid administrative and repressive levers of influence. R. Sitarchuk traces the evolution of the development of the Seventh-day Adventist religious movement in Ukraine from the end of the 19th century to the second half of the 1930s, providing information on the number of Adventist communities in Podillya.

However, despite the significant number of publications on this topic, not enough attention was paid to the situation of Protestant religious organizations in the Podolsk region. Therefore, the purpose of this article is to cover the functioning of the leading Protestant denominations in Podillya in the 1920s.

Presenting main material. The Russian Empire was an Orthodox state, where spiritual and secular power were in inseparable unity and interaction. Some Christian movements did not have complete freedom for their functioning and were subject to restrictions. After the revolutionary events of 1917, the situation changed, the empire disappeared, and Orthodoxy ceased to be the official religion. Various Christian groups and organizations gained more freedom and became more active, hoping that better times would come. Soon their hopes were dashed. A new empire, the Bolsheviks, emerges, and atheism becomes the official ideology. Christian organizations found themselves in new realities.

Having more opportunities for propaganda, religious groups began to recruit new members. In the 1920s, the number of Protestant communities gradually grew. All religious movements that did not belong to the traditional churches were classified by the Soviet authorities as "sectarianism." Under this name, they appear in official reports, resolutions of the authorities. Sects are a fairly broad group of religious denominations: Evangelical Christians, Baptists, Seventh-day Adventists, Pentecostals, Jehovah's Witnesses, Mennonites, Dukhobors, Molokans, Whips, Johnnies, and others. Among the religious movements of the Protestant trend, the Kyiv Regional Union of Evangelical Christians (Evangelical Christians), the All-Ukrainian Union of Baptists (Baptists), the All-Ukrainian Association of Seventh-day Adventists (Adventists), the All-Ukrainian Union of Evangelical Christians, and the Evangelical Faith they are most often found in the reports of local authorities of the Podolsk province. Conventionally, this group includes Jehovah's Witnesses (Jehovah's Witnesses), who differ significantly in their religious beliefs, but also operate in the region. There was also an Evangelical Lutheran Church in the USSR. In the documents of the NKVD (The People's Commissariat for Internal Affairs), it does not appear as a sect, but is included in the list of major church denominations, along with the ROC (Russian Orthodox Church), UAOC (Ukrainian Autocephalous Orthodox Church), reformers and Roman Catholics [TsDAVO. FR-5.

Op. 2. Ref. 948. p.15]. Sectarianism in those years was quite diverse, often individual groups adopted the ideas of different denominations.

At a meeting of the Vinnytsia District Party Committee of the CPBU (The Communist Party of Ukraine) in June 1923, one of the reports spoke of the strengthening of the sectarian movement, stating that there were 1 to 3 sects in each parish. Sects propagate their teachings among the peasantry, in some places penetrated universal education. The speaker is also surprised to note that the Orthodox Church does not oppose the spread of sectarian beliefs [DAVIO. F P-29. Op. 1. Ref. 17. p. 17]. For a long time, some activists did not understand that the ROC had become a persecuted church, persecuted by an atheist state, and weakened by divisive activities. In such circumstances, it was unable to resist the spread of the sectarian movement. Although Protestant teachings continued to be classified as heretical.

The leaders of the time sometimes sought to use the Orthodox Church in the struggle against the sectarian movement. An interesting case was recorded in Mykolayiv, one of the party activists offered to organize a circle of zealots of Orthodoxy, which in his opinion should oppose the spread of sectarian teachings.

Evangelical Christians, faced several restrictions on religious activity, were outraged by this state of affairs, and expected a somewhat different attitude from the Socialist Republic. They did not understand why they were placed on an equal footing with the "dominant churches." Thus, the Kyiv Regional Union of Evangelical Christians sent an appeal to the SNC and the CEC and the USSR in 1922, which depicts the current situation. Evangelical Christians are asked to treat this appeal with civil justice and a socialist conscience. It is reported that the Kyiv Regional Union of Evangelical Christians has received many complaints from the communities of Podil Province, in particular from Haisyn County, about the use of violence and restrictions against them. The document reports on the existence of 244 union communities in Kyiv, Podil, Volyn, Chernihiv, and Poltava provinces, and states that evangelical Christians have long been persecuted under imperialist dynasties. They hoped that the time of persecution had passed, they would be able to preach their doctrine peacefully, enjoying the freedom of the world's first free socialist Soviet republic. But their dreams vanished and they found themselves on the threshold of new trials. They are faced with significant restrictions on their activities, they are forbidden to collect charitable donations, to raise children in accordance with the teachings of evangelical Christians, to use their seals, and so on. It was also reported that the RNA's decree on the release of persons from military service on religious grounds is often ignored, and instead of service they are involved in the search and extradition of bandits. Evangelical Christians ask for the abolition of repressive measures applied to them [DAVIO F R-925. Op. 8, Ref. 47. s. 5].

Religious Protestant communities existed in many areas of the Podolsk province. The activity of the community of evangelical Christians was recorded in 1922 in Haisyn district of Podil province [DAVIO. F R-886. Op. 4. Ref. 29. p. 4, 12]. In the reporting documents for July 1923, the provincial department of the GPU provided information on the existence of 10 sectarian movements in the Proskuriv district, about 100 groups

uniting 3,276 people. It is also reported that in the village of Cherepova, Proskuriv district, sectarian figures from various places conducted mass sermons in the presence of about 400 peasants, including 37 people. were baptized and joined the organization [DAVIO. F R-925. Op. 8. Ref. 47. s. 43].

The provincial liquidator in 1923 testified to the strengthening of the Adventist sect and the weakening of the Baptists, the latter having no significant number of followers [DAVIO F R-925. Op. 8, Ref. 47. s. 5]. In 1924, in the Bratslav district of the Tulchyn district, local authorities recorded two communities of evangelical Christians, in the town of Bratslav and in the village of Chukiv [DAVIO. F R-1304. Op. 4. Ref. 43. S. 121].

Modern research suggests that most sectarian communities were in the north and west of Podillya. Some information confirms this assumption. For example, in the Bilopil district of the Berdychiv district of the then Kyiv province, sectarian communities were recorded in seven villages of the district, among which were evangelicals, Adventists, and Baptists [DAVIO. F R-4083. Op. 1. Ref. 262. S. 28]. Evangelical Christians even managed to create an youth group of 11 people in the Kutyn district of the Kamyanets district [TSDAVO. F R-5. Op.2. Ref. 953. P.29].

Protestant organizations did not always register their communities. One of the reasons is the lack of a special prayer room. Registration provided an opportunity for religious services and the use of a house of prayer. In the absence of a special room, the community was not always in a hurry to prepare registration documents. Protestant churches were not temples like Orthodox or Catholic ones. Religious services could be held in any room. The lack of registration was also due to a lack of followers. Therefore, data on the presence of sectarian organizations vary, it is necessary to distinguish between the number of identified organizations and the number of registered.

Due to the strengthening of the sectarian movement, local authorities began to demand not only general information about the existence of religious organizations, but specifically about the nature of each sect, the number of its followers, and so on. There were even attempts to involve certain religious movements in socialist construction, using their inherent fraternal spirit, solidarity, and collective activity. Based on the above-mentioned principles, they tried to create collective farms in the countryside, so to speak, to direct the activities of the religious community in the right socialist direction.

It is for this reason why Gaisinsky liquidator demanded the submission of information:

- the number of sects where the followers mostly live - in the city or in the village, to which segments of the population they belong;
- the attitude to Soviet authorities and Communism;
- the groups which deny private property and preach community work;
- the groups which gravitate to private property, engage in trade, speculation, ie are bourgeois;
- whether they participate in cooperatives and other organizations [DAVIO. F R-886. Op. 1. Ref.101. S. 10].

Some religious collective farms were still created. But they did not suit the

communist government - during the continuous collectivization it turned out that the "Baptist" collective farms functioned much better than ordinary collective farms. For collectivization organizers such facts became, to put it mildly, inconvenient.

To popularize their faith and convert new members, religious agitators moved from one area to another. Accordingly, the religious movement intensified in some areas. In order to limit the preaching work, registration cards of cult ministers were introduced. When moving, they had to be deregistered from one area and record their stay in another [TSDAVO. F R-5. Op.2. Ref. 953. S. 44]. A report by the Board of the All-Ukrainian Union of Baptists to the All-Ukrainian Central Executive Committee with a request to abolish the requirement to register preachers attending religious Baptist societies in different districts has been preserved [TSDAVO. F R-5. Op.2. Ref. 953. S. 41].

The question arises: how many Protestant communities operated in the Podolsk province? What part among all religious communities did they occupy? According to the NKVD of the USSR, 408 religious communities were registered in the Kamyanets district in 1924, including 21 sects and two Lutheran communities [TSDAVO. F R-5. Op.2. Ref. 197. S. 269]. By 1926, the number of registered sectarian communities had increased significantly. There were already 74 Protestant communities in the Kamyanets district with a population of 1,290, including 23 evangelical Christians, 39 Baptists, and 12 Adventists.

In the same year, there were 93 Protestant sects in Vinnytsia district, with a population of 1477 people, including Evangelical Christians, 61 communities, Adventists, 12 communities, and Baptists, 20 communities. In the Proskuriv district at that time, there were 100 communities of this direction, with a population of 1442 people, including evangelical Christians 69 communities, Baptists 14, Adventists 16. In the Mogilev district in 1926, there were 73 Protestant communities with a population of 818 people, including 65 communities of Evangelical Christians, 3 Baptist communities, 4 Adventists communities, one Pentecostals community. In Tulchyn district at that time there were 52 communities, with a population of 1128 people, including 40 communities of evangelical Christians, 10 Baptists communities, 2 Adventists ones [TSDAVO. F R-5. Op.2. Ref. 948. S. 15].

As can be seen from the above mentioned data, most Protestant communities existed in Vinnytsia and Proskuriv districts, which confirms the aforementioned statement about the greatest spread of the sectarian movement in the north and west of Podillya. It is also possible to draw a conclusion about the strengthening of Protestant organizations in the region. But it is not necessary to overestimate the scale of such a movement, in 1926 in the Tulchyn district, as already mentioned, there were 1128 Protestants, in the same district in some villages communities of registered Orthodox Christians were larger than this figure. That is, there were more Orthodox in one village of Tulchyn district than all Protestants in the district.

In total, 1,324 sectarian organizations were registered in Ukraine in 1926, with a population of 15,9456, of which evangelical Christians numbered 549 communities (70,594 people), Baptists - 461 communities (33,426 people), and Adventists -

98 communities.), Pentecostals - 22 communities (625 people), Mennonites - 79 communities (42875). The presented data do not give an accurate picture of the activities of religious communities in this area, as some groups did not always come into the field of view of the Soviet authorities, we are talking only about registered communities.

In 1926 in the USSR according to the NKVD, there were 9078 church communities, with a population of 5606948 people. Among them are communities of the Lutheran Church in the number of 214 organizations, with a population of 47,375 people. Since the sectarian movement appears separately in the materials of the NKVD of the USSR, sectarian organizations should be added to the total number of church communities in order to find out the total number of religious organizations. Thus, sects in the USSR accounted for 12.7% of all religious organizations, believers of sects accounted for 2.8% of the total religious population. Protestant communities, including Lutherans, accounted for 13.7% of all religious organizations (excluding Lutheran communities, 11.6%), and Protestant populations accounted for 3.5% of all believers in the republic. In Podillya, Protestant communities accounted for 23.3% of all religious communities, and their followers accounted for 2.2% of the total religious population of the region (the latter figure is calculated without data for the Proskuriv district). Thus, in terms of the number of registered communities, the Protestants of Podillya were ahead of the general republican indicator, and in terms of the number of believers it was approximately at the same level.

Despite the fact that in the USSR all religious denominations were considered an obstacle to building a communist society, the main opponents of the Soviet government were the ROC (Tikhonovites) and the UAOC (Lipkivtsi). Therefore, to combat them, the authorities sought to use sectarian organizations, the numerical growth of which weakened these churches. It was relatively easier for Protestant organizations to obtain permission to hold their conventions than for representatives of the Tikhon and Autocephalous churches. The organizational work of the Renewal Churches was fully supported by the state. [6, p.108].

In the late 20's authorities launched a decisive offensive against religious communities, the rights of denominations were severely restricted. The attitude to sectarian organizations has changed, the activity of which is now recognized as reactionary and hostile [7, p. 59]. The NKVD-DPU increasingly began to use repressive measures against Baptists, Evangelical Christians, and Adventists. The number of Protestant communities began to decline.

Taking into account all the submitted materials, we can make the following conclusions:

- in the first half of the 20s of the XX century the Protestant religious movement is intensifying on the territory of Podillya;
- the main Protestant organizations were evangelical Christians, Baptists, Adventists, and Pentecostals;
- the Protestant movement had its distinctive features, which were reflected in the process of community registration;

- representatives of the then authorities classified the Protestant movement as sectarianism, with the exception of Lutheran organizations;
- the spread of the Protestant movement alarmed the party leadership of the Podolsk province, measures were taken to identify and neutralize such a movement, increased atheistic propaganda and administrative pressure;
- Protestant organizations operated in all districts of the Podolsk province, slightly fewer in the Mogilev and Tulchyn districts, and more in the Proskuriv and Vinnytsia districts;
- in terms of the number of registered Protestant communities, Podillya is slightly ahead of the general republican indicator, but in terms of the number of followers of such a movement it is approximately at the same level;
- in the late 20s and early 30s of the XX century, the authorities launched a decisive offensive to eradicate the sectarian movement, including the main Protestant movements.

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GEOLOGY

COMPARISON OF DEFINITION CRITERIA AND CLASSIFICATION FEATURES OF RESERVES AND RESOURCES IN NATIONAL AND INTERNATIONAL PRACTICE OF GEOLOGICAL AND ECONOMIC ASSESSMENT ON EXAMPLE OF COAL DEPOSITS

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Annotation. *The purpose of the study is to identify the main similarities and differences of methodological approaches when determining the amount of reserves and resources of coal deposits in domestic and international practice. The comparison of the classification features of coal reserves and resources was carried out for methodological recommendations of national regulations and the Australian Guidelines for Estimation and Classification of Coal Resources.*

Keywords: *geological and economic assessment of deposits, coal reserves, classification of reserves and resources, commercial significance, international standards.*

Problem statement in general terms and its relation to important scientific or practical tasks. An important economic problem of Ukraine, which also has a social and political significance, is the problem of providing fuel and energy resources. The main factor hampering the development of the industry is the lack of investments that currently does not allow providing a faster start-up of production facilities. The development of the industry is interfered, in particular, by the lack of an effective owner, unbalanced prices for commodity coal product and products used in its production and insufficient investments.

One of the possible ways of attracting investments in the coal industry is the public placement of securities of mining companies (stocks) at the stock exchanges of the world, of The resource base of securities of mining companies during their public placement has a great importance. Most developed economies have legally established procedures for disclosure and public reporting of reserves and mineral resources.

Analysis of recent research and publications. For mining companies whose shares are placed on international stock exchanges or for companies which plan IPO (Initial Public Offering, the primary public offer is the placement of securities) it is necessary to pass the procedure for approval of reserves of mineral deposits according to international

reporting standards.

Today there are about 150 officially recognized classifications of reserves and resources of minerals in the world, according to which geological and economic assessment is carried out. The Australasian Code for Reporting of Exploration results (JORC) [6] has become the most widespread and world-wide authority for the evaluation of solid minerals.

With the release of the first version of the JORC Code in 1989, geologists and stock exchanges of the world received a document that sets standards for the quality and transparency of exploration materials. This code played a crucial role in the development of national reporting codes around the world: in the USA – the SME Code (1999), in South Africa – the SAMREC Code (2000), in Canada – the CIM Code (2001), in Chile – the Commission Mineral Code, in the European Union – PERC Code (2001), in Russia – the NAEN Code (2011) and many other countries of the world. The JORC Code has served as a template for codifying the codes of the Committee for Mineral Reserves International Reporting Standards – CRIRSCO (2006).

In Ukraine the geological and economic assessment is carried out on the basis of the Classification of reserves and resources of the minerals of the state subsoil fund, which was approved by the Resolution of the Cabinet of Ministers of Ukraine No. 432 dated on 05.05.1997 [3]. The principles of distribution of reserves and resources of minerals to the accounting groups adopted in the domestic Classification are harmonized with the United Nations Framework Classification for Fossil Energy and Mineral Reserves (UNFC) developed by the Ad hoc Group of Experts of the Renewable Energy Committee of the United Nations Economic Commission for Europe (UNECE).

Classification attributes of the national Classification that inherited the definition of reserves and resource categories and the JORC system (adopted as the basis for international reserves reporting standards CRIRSCO) have common features and differences in practical application. The classifications use a general principles for deposits assessment that include the collection and assessment of geological data, the determination of the geometry of the ore body, the calculation of resources and reserves available for recovery, with simultaneous verification of the reliability of the data received.

Outlining of previously unsettled parts of the general problem. International systems of reserves assessment such as CRIRSCO are more traditional and understandable to foreign investors and they simplify the procedures for calculating real (recoverable) reserves of companies, which allows identifying risks for investors when providing bank loans. Despite the fact that Ukraine has been the first country in the former USSR to adapt the national classification of mineral reserves and resources to the UNFC, this system is not among the mandatory stock exchange documents, because some of its provisions do not meet the requirements of the Committee for Mineral Reserves International Reporting Standards (CRIRSCO) that are widely used abroad. The use of the current Classification of mineral reserves and resources of the State Subsoil Fund makes it possible to compare the usual categories of reserves and resources (A+B+Cl)

with the UNFC Framework Classification, due to the use of a three-digit code. In this case, CRIRSCO's methodological approaches are somewhat different from the listed classifications and require separate analysis and comparison with national requirements for outlining of reserves and resources of solid minerals.

Formulating goals of the article. In national practice of assessment of coal deposits the classification, which is a tool for harmonizing accepted methodological approaches to international standards, is used [2], at the same time the former classification of reserves and resources in the form of categories A+B+C is also applied. The main goal of the study is to identify similar and different methodological approaches in national classifications and JORC international assessment standards. The clarity in differentiation of classification features will simplify the procedure for the transfer of certain groups of reserves and resources obtained in the process of assessment according to different requirements and, in general, will improve the understanding of all geological information on the assessment of coal deposits, in particular, such features as the reliability of the assessment, the consideration of a complex of modifying factors, etc.

Presentation of the main material. The methodology of geological and economic assessment of coal deposits (subsoil areas) for the State Subsoil Fund of Ukraine is based on the use of common principles: calculation, geological and economic assessment and state accounting of mineral resources in accordance with their commercial value and degree of geological, technical and economic study, and conditions, which determine the preparedness of explored mineral deposits for commercial development, as well as the basic principles of quantitative assessment of mineral resources.

In 2014, the approaches were developed in the work [5] to harmonize the Ukrainian national classification of reserves and resources of the mineral resources of the State Subsoil Fund with other classifications of world leading industrial and financial groups such as CRIRSCO (solid minerals) and SPE (raw hydrocarbons). The formal procedure for this harmonization is quite complicated. However, the complex of generalizations and studies presented in this work, gave an opportunity to outline the main perspectives for solving the problem of harmonization.

In the standard CRIRSCO “the JORC Code of 2012 Edition” requires minimum standards for public reporting on exploration results, mineral resources or ore reserves [6].

Within the frames of the Reporting Standard (CRIRSCO) concerning the exploration results, the Australian Guidelines for Estimation and Classification of Coal Resources–2014 [7] is used as a guideline for coal resources or reserves. This code contains 42 articles, which are actually methodological recommendations for the assessment of coal resources and reserves and are reporting regulation.

In national practice of assessment the common principles for conducting all components of deposits assessment are set forth in the Classification of Reserves and Resources of the State Subsoil Fund. Given the difference in systems of terms and definitions in classification systems it is expedient to compare the main assessment criteria used in the abovementioned documents [1–3, 7].

In order to assess coal deposits in Ukraine, the provisions of the Instruction on

application of the Classification of Minerals Reserves and Resources of the State Subsoil Fund are used as guidance for coal deposits [2]. According to this document, the main classification features for the differentiation of coal objects are the following (according to clause 1.1):

1. Field-geological types,
2. The complexity of the geological structure,
3. Commercial significance
4. Degree of technical and economic study,
5. Degree of geological study,
6. Degree of study of concomitant minerals,
7. Preparedness for commercial development.

The Instruction includes detailed requirements for the study of coal deposits, methods of their testing, their contouring and calculation according to geological-commercial typification, complexity of geological structure and other factors of assessment reliability. The comparison of the main classification features (commercial value, degree of technical, economic and geological study) of the Instruction [2] and provisions of the document [7] are given in Table 1.

It should be noted that the belonging of the assessment object to each of the identified groups according to the specified classifications does not always have exact compliance and should be evaluated in each case on the basis of available geological information. Particular attention should be made to the differentiation of coal reserves and resources according to commercial significance. The similarity of both systems is that this feature is applied exclusively to coal reserves, and in both cases it is aggregated for the list of factors that determine the commercial significance of the deposits. In national assessments all factors that determine the commercial value of the field, as a rule, are united in the following groups:

the 1st group consists of mining-geological and mining-technical factors, 2 – technological factors that determine the ability of minerals to turn into commodity products with given qualitative characteristics; 3 – socio-economic (value, liquidity of minerals and their processing products for the economy, needs and degree of availability of reserves of this type of raw material); 4 – economic-geographic (transport-geographical factors characterizing remoteness from consumers, development degree of the development area, energy and transport conditions, etc.), 5 – environmental factors. In addition the external factors of commercial development of the field such as administrative, legal and organizational conditions are also evaluated.

In order to get an unambiguous answer about the commercial value of coal reserves, all listed criteria in the result of technical and economic calculations shall be converted into the cost of reserves in the form of cost and revenue components of monetary valuation. In this form the relationship between the classification criteria of commercial significance and the degree of technical and economic study finds its expression.

Table 1

Comparison of the main classification criteria

(Compiled by the author according to documents [3, 7])

Reserves and resources classification criteria	Instruction on application of the Classification of Minerals Reserves and Resources of the State Subsoil Fund for coal deposits	Australian Guidelines for Estimation and Classification of Coal Resources	Notes
Commercial value	Balance reserves	Proved Coal Reserves*	
		Probable Coal Reserves	
	Conditionally balanced and off-balance sheet reserves	Inventory Coal	
	Commercial value is not defined		
Degree of technical and economic study	GEO-1	Feasibility study (FS)	Conditional compliance is set for FS, PFS, SS
	GEO-2	Preliminary feasibility study (PFS)	
	GEO-3	Scoping study (SS)	
Degree of geological study	Explored reserves	Measured Coal Resources	Coal resources have a terminology similar to the mineral resources of the JORC Code
	Preliminary explored reserves	Indicated Coal Resources	
	Prospective resources	Inferred Coal Resources	
	Inferred resources		

coal reserves have terminological significance similar to ore reserves of the JORC Code

In the recommendations for additional assessment of coal objects [6, 7], according to JORC templates, 2 groups of coal reserves are outlined according the commercial value – Proved and Probable Coal. In this case, the list of modifying criteria, which include the following, is used [5]:

- 1) availability of rights for development of mineral resources and subsoil use;
- 2) methods of data aggregation;
- 3) justification of the boundary assessment parameters;
- 4) mining engineering solutions;
- 5) technological factors;
- 6) factors of cost and profitability;
- 7) market condition of mineral raw materials;
- 8) environmental factors;
- 9) administrative and legal;
- 10) social factors;
- 11) assessment reliability.

From this list we can conclude about significant compliance of the list of factors

taken into account when establishing the commercial value in national assessment systems with the international standard. In addition, one of the features of Australian Guidelines for Estimation and Classification of Coal Resources is the availability of Inventory Coal category, which can be conventionally compared with the categories of inferred resources and conditionally balance reserves, and with those groups of reserves for development of which there was no feasibility.

Inventory Coal is defined as a category that is used to fully assess the state resource base in "non-public" reporting for strategic planning purposes. This category includes coal resources for which a certain amount of exploration work has been carried out, but they are insufficient for a reliable assessment. According to definition [7] this category includes all known coal resources. The location, geological characteristics and conditions of coal occurrence are known for them, but modifying factors are not used for their assessment, since they do not establish the rationality of commercial recovery.

Also, particular attention shall be paid to the requirements for the detailed geological study of subsoil areas and quality of minerals. National Methodological Recommendations [1, 2] contain a rather complete list of requirements and indicators that are being assessed. Test parameters and the density of prospectings that provide the reliability of geological information are established depending on the list of geological mining factors that determine the complexity of the geological structure.

Coal beds are differentiated by Methodological recommendations based on: 1) thickness – thin (less than 0,7 m), average (0,71–1,2 m), large – more than 1,2 m; 2) continuity of coal beds (V,%); 3) seam inclination – layers with horizontal (0–5 °), flat-laying (6–18 °), sloping (19–35 °), semi-steep (36–55 °) and steep (56–90 °) occurrences; 4) degree of displacement on tectonically complex mines (sections).

The main indicators of coal quality, which are considered in both methodological recommendations, are the vitrinite reflectance index (R_o , %), the yield of volatile substances (V_{daf} , %) and the indicators characterizing their main technological properties [1, 2]:

- for brown coal – the mass fraction of maximum wet-strength on the ash-free residue (W_{maxaf} , %), the yield of semi-coking resin (TsK_{daf} , %) and the higher combustion heat for a dry ash-free residue (Q_{sdaf} , MJ / kg);
- for hard coal – the thickness of the plastic layer (Y) mm;
- for high-metamorphosed coal - the higher combustion heat for a dry ash-free residue (Q_{sdaf} , MJ / kg), the coefficient of sintering according to the Roga index (RI);
- for anthracite - higher combustion heat for a dry ashless residue (Q_{sdaf} , MJ / kg).

Also, in Australian Guidelines for Estimation and Classification of Coal Resources the requirements for coal testing with the necessary reliability of the results are stated, in addition, the requirements for the density of prospectings are determined by the variability of statistical parameters of assessment.

The particularity of the requirements for assessing coal reserves and resources established by Australian Guidelines for Estimation and Classification of Coal Resources is the need for a detailed statistical analysis of quantitative geological information, large-

scale application of geostatistical methods (construction of variograms) and geological modeling (using geological and mathematical models), clause 5.6–5.8 [7].

A separate example of the comparison of the classification features used in national and international standards for the coal assessment can be illustrated for the reserves of the Krasnoarmeyskaya Zapadnaya Minefield No. 1 at PJSC “Shakhtoupravlenie Pokrovskoe”.

At the end of 2012–early 2013 Donetskstal Group, which includes PJSC “Shahtoupravlenie Pokrovskoe”, has involved a world expert in the mining industry - IMC-Montan Consulting GmbH (“IMC”) to assess independently the reserves and resources of its coal assets, PJSC “Shahtoupravlenie Pokrovskoe.” This report, that summarizes the results of the independent review of the Pokrovsky mine and the Svyato-Varvarinsky coal preparation plant, carried out by IMC's specialists, was prepared to meet the world-recognized requirements for public reporting.

IMC analyzed reserves and resources reports compiled by the Company in accordance with previous classification methods, and interpreted reserves and resources in a new way according to the criteria, commonly accepted categories of reserves and resources of JORC. The final results of the assessment are as follows: according to JORC standards, the mineral resources of the mine “Pokrovskoe” in November 2012 amounted to 290180 thousand tons (Table 2) [8, 9].

Table 2

**Differentiation of coal resources according to degree of the geological study
(Compiled by the author according to documents [8, 9])**

Measured resources (thousands of tons)	Indicated resources* (thousands of tons)	Inferred resources (thousands of tons)	Total ** (thousands of tons)
268396	21784	-	290180

According to the “JORC” standards, the mineral reserves of the mine “Pokrovskoe” as of November 8, 2012 amounted to 119 882 thousand tons (Table 3).

Table 3

**Differentiation of coal reserves according to degree of the study
(Compiled by the author according to documents [8, 9])**

Probable Coal Reserve (thousands of tons)	Proved Coal Reserve (thousands of tons)	Total (thousands of tons)
32084	87798	119882

According to JORC standards, the mineral resources of the Pokrovsky mine, as of November 8, 2012, were: Probable Coal Reserve (probable) – 32084 thousand tons, Proved Coal Reserve (proven) 87798 thousand tons, and total: 119882 thousand tons [8, 9]. Outlined groups of reserves make up about 41% of the total amount of resources, which is explained by the exclusion of the part that is not recovered from the depths in

accordance with mining, technological decisions or economic, environmental and other reasons. Thus, the allocation of groups of reserves according to the recommendations [7] is comparable to the definition of commercial and operational reserves of high categories of geological study (categories A+B) according to the methods of national assessments.

On the basis of an independent assessment, IMC came to the conclusion about a high-quality management of mining company “Donetskstal Group” and estimated the cost of Donetssteel's coal assets at the operational level of 2,863 million US dollars, assuming that the real discount rate is 10% (at the current NBU discount rate – 7.5 %), the exchange rate is UAH/USD 8.1, and product prices, capital and operating costs, and production forecasts are fully justified.

According to the list of classification features for this case, it is appropriate to compare the categories of resources (Measured, Indicated, Inferred Resources) and reserves of all categories that are accounted for this object of subsoil use and the categories of Coal Reserves with the number of explored reserves. The state balance on the mine includes the reserves assessed by the State Commission of Ukraine on Mineral Resources, as well as reserves estimated by the State Commission of USSR on Mineral Resources.

In comparison with the first quantitative indicators, the exact coincidence of the volumes of explored and previously explored reserves with all categories of the Coal Resources was found. For the categories of Coal Reserves and explored reserves there are significant differences that are associated with the use of modifying factors for their definition in the case of JORC terminology.

According to the list of factors, the values of Coal Reserves are more in line with the amount of commercial reserves - a part of the balance reserves that is recovered from the subsoil in accordance with the project or plan for development of mining operations; and is determined taking into account design losses during development.

In this case, commercial reserves from the balance sheet are significantly higher than the accounted quantities of Coal Reserves (more than 35%). This is explained by the fact that in national practice commercial reserves are calculated based on all quantities of explored and previously explored categories, while the foreign categories of Coal Reserves are based on the most reliable quantities of Indicated + Measured resources.

Comparing the assessments of IMC and the State Commission of Ukraine on Mineral Resources, it can be noted that the Probable Coal Reserves and Proved Coal Reserves include high-grade geological survey categories (A+B) (taking into account the coal reserves located in the pit stoop under the mine shaft).

Conclusions. In general, based on comparison of the classification features used in national and international systems (standards) for assessment of coal deposits, a large number of common requirements for reliability of results of geological study can be found. In the methodological recommendations that are compared in this work, the main classification features are the degree of geological study, the commercial value (or appropriate modifying factors of assessment) and the degree of technical and economic study. The belonging of the assessment object to each of the identified groups according to the specified classifications does not always have exact compliance and should be

evaluated in each case on the basis of available geological information. The main differences between the standards for assessment of coal reserves and resources lie in justification of reliability of assessment parameters, which in international practice uses direct requirements for statistical analysis and geostatistical modeling of deposits.

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